11-6-2014

Educational Policies Committee Agenda, November 6, 2014

Utah State University

EDUCATIONAL POLICIES COMMITTEE AGENDA

6 November 2014

A meeting of the Educational Policies Committee will be held on 6 November 2014 at 3:00 pm in Old Main 136 (Champ Hall Conference Room)

I. Approval of the minutes of the 2 October 2014 meeting

II. Subcommittee Reports

a. Curriculum Subcommittee (Ed Reeve)

Course Approvals

Request from the Department of Biology to add a new Human Biology emphasis to the existing BS.

Request from the Department of Economics and Finance to create a minor in Real Estate.

Request from the Department of Health, Physical Education, and Recreation to discontinue the School Health emphasis.

Request from the Department of Health, Physical Education, and Recreation to discontinue the School Health Teaching minor.

Request from the Department of Instructional Technology and Learning Sciences to reduce 20 credit hours from the BS to PhD and 17 credit hours form the MS to PhD.

Request from the Department of Plants, Soils, and Climate to change the name of the major in Environmental Soil/Water Science to Land-Plant-Climate Systems.

b. Academic Standards Subcommittee (Scott Bates)

No report

c. General Education Subcommittee (Norm Jones)

October 21, 2014, 8:30 A.M.
Champ Hall Conference Room

Present: Dean Adams, Engineering; Eddy Berry, Social Sciences; Dan Coster, Quantitative Intensive; Brock Dethier, Writing Program; Doug Fiefia, USUAS President; Laura Gelfand, Caine College of the Arts; Dawn Kirby, Humanities and Social Sciences; Harrison Kleiner, Connections; Kacy Lundstrom, Library; Brian McCuskey, Humanities; Kris Miller, Honors; Karen Mock, Natural Resources; Bob Mueller, Regional Campus; Dick Mueller, Science; Melanie Nelson, USU Eastern;

Michele Hillard, Secretary; Larry Smith, Provost's Office; Lawrence Culver, American Institutions; Ryan Dupont, Life and Physical Sciences; Mary Leavitt, Advising; Shelley Lindauer, Education and Human Services

Absent: Kathy Chudoba, Business; Cindy Dewey, Creative Arts; Stephanie Hamblin, University Advising; John Mortensen, Student Services; Lee Rickords, Agriculture and Applied Sciences; Janet Anderson, Provost's Office; Norm Jones, Chair

Visitor: Barbara Williams, Provost's Office

Call to Order – Dawn Kirby

Approval of Minutes – September 16, 2014
Motion to approve made by Dean Adams, Laura Gelfand seconded. Minutes approved.

Course Approvals

Course/Designation Removals

Syllabi Approvals
CMST 3700 (CI) Approved ..... Brock Dethier
Motion to approve made by Brian McCuskey, Karen Mock seconded. Motion approved

CMST 4460 (CI) Approved ..... Brock Dethier
Motion to approve made by Brian McCuskey, Karen seconded. Motion approved

USU 1300 (BAI) Jeff Bateman Pending..... Lawrence Culver

WILD 5700 (CI) Pending ..... Brock Dethier

Business
HONR 3070 (Change in required credits)
Change wording to reflect the requested change. Write it so that the model includes flexibility for all students. Make it 3-6 variable credits.

Below is a link to the recent article about our Gen Ed Program that appeared in the "campus model" section of an Assoc. of American Colleges and Universities publication.
http://www.aacu.org/campus-model/aligning-general-education-and-major-utah-state-university

USU was also recognized as having a model program in the text of the Degree Qualification

Profile recently released by the Lumina Foundation and the Assoc. of American Colleges and
Universities.

Meeting Adjourned: 8:50 am

EDUCATIONAL POLICIES COMMITTEE MINUTES

2 October 2014

A meeting of the Educational Policies Committee was held on 2 October 2014 at 3:00 pm in Old Main 136 (Champ Hall Conference Room)

Present: Larry Smith, Chair
Roland Squire, Registrar's Office
Heidi Kesler, Curriculum Retention
Michele Hillard, Secretary
Richard Mueller, College of Science
Karen Mock, Quinney College of Natural Resources
Kevin Olson, Caine College of the Arts (representing Nick Morrison)
Norm Jones, General Education Subcommittee Chair
Kacy Lundstrom, Libraries
Ed Reeve, Curriculum Subcommittee Chair
Kelly Fadel, Huntsman School of Business
Thom Fronk, Engineering
Melanie Nelson, USU-Eastern
Scott Bates, Academic Standards Subcommittee Chair
Eddy Berry, Humanities and Social Sciences
Jared Schultz, Education and Human Services
Derek Hastings, Graduate Studies Senator

Absent: Doug Fiefia, USUSA President
Scott DeBerard, Graduate Council
Nathan Straight, Regional Campuses

Visitors: Dawn Kirby, SR Associate Dean, College of Humanities and Social Sciences
Mehmet Tekerek (visiting professor)

A meeting of the Educational Policies Committee will be held on 2 October 2014 at 3:00 pm in Old Main 136 (Champ Hall Conference Room)

I. Approval of the minutes of the 9 September 2014 meeting (see below)

Norm Jones moved to approve the minutes of the 9 September 2014 meeting. Eddy Berry seconded; minutes approved.

II. Subcommittee Reports

a. Curriculum Subcommittee (Ed Reeve)

Ed Reeve reviewed the Curriculum Subcommittee business.

All courses were approved.

The Request from the Department of Computer Science to reduce the number of PhD credits was approved. (see below)

The Request from the Department of Geology to discontinue the current BS degree in Applied Environmental Geoscience and create an emphasis in Applied Environmental Geoscience in the existing BS was approve pending minor revisions. (see below)

The Request from the Department of Mechanical and Aerospace Engineering to offer a PhD in Aerospace Engineering was approved. (see below)

Discussion on degree standardization in the catalog including the Gen Ed and using a template for consistency.

Norm Jones moved to approve the business of the Curriculum Subcommittee. Richard Mueller seconded; motion approved.

b. Academic Standards Subcommittee (Scott Bates)

Minutes April 17th, 2014

Present: Scott Bates (Chair, Emma Eccles Jones College of Education and Human Services), Thomas Fronk (College of Engineering), Stephanie Hamblin (Advising), Dawn Kirby (College of Humanities and Social Sciences), Clifford Skousen (Huntsman School of Business), Roland Squire (Registrar's Office).

Absent: Doug Fiefia (USU/SA).

Guests: Melanie Bowen (Registrar's office), BrandE Faupell (Human Resources), Richard Mueller (College of Science)Brandy Reeves (Registrar's Office), Marci Smith (Registrar's Office).Agenda April 17th, 2014

OLD BUSINESS

Revision to the Academic Record Adjustment and Request for Refund Policy (Guest: BrandE Faupell, HR; documents attached). The attached revision to the Academic Record Adjust and Request for Refund Policy was discussed.

The inclusion of a definition of "immediate family," which was based on the human resources bereavement policy, was clarified. Specifically, the word "partner" was to be included; this brings the policy in-line with various HR and other campus-wide policies. In addition, the phrase "persons living in the same household" was to be excluded as it could be confusing and less-relevant to students (although it is

currently included in HR policies on bereavement).

In addition, language that specified documentation was to come from a "medical doctor, physicians assistant, or nurse practitioner" was revised to include "licensed caregiver" in order to allow any licensed caregiver to provide necessary evidence for the policy's intent (to provide a record adjustment and/or refund). It was specifically discussed that mental health issues could be a reasonable use of the policy.

VOTE 2014-04-17-1. Motion to approve the new policy and relevant forms as revised (attached). Moved: Roland Squire. Seconded: Dawn Kirby. Outcome: passed

NEW BUSINESS

The Excused Absence Policy was discussed (Guest: Richard Mueller). Specifically:

- The location of the policy in student code was seen as problematic—the current policy is a part of the code related to student groups, but the policy has been expanded to include other students (outside of student groups) therefore, the current location is no longer a logical one.
- Issues related to instructor implementation of this policy were discussed. Example: if students in a class are allowed to "drop one of four exams," an excused absence should not limit a student's access to this class policy. That is, an excused absence should not simply be identified as "the dropped exam."
- The issues around the scope of the policy were discussed. Specifically, lab courses that require significant set-up time were discussed in the context of this policy, as was the idea that there should be a limit to the number of excused absences.
- The role of the Academic Standard Subcommittee of the EPC was discussed. Specifically whether or not Academic Standard Subcommittee of the EPC had a role in this policy.

  Action: Bates will meet with chair of EPC to discuss processes and, if it is determined that EPC would welcome a revision proposal from Academic Standard Subcommittee of the EPC, Bates will draft suggested changes to the existing student code and general catalogue; submit it to discussion and vote of the Academic Standard Subcommittee of the EPC in the first meeting of the fall, 2014.

  B. Dual Course Listing Policy was to be discussed. This issue was tabled until fall 2014.

FUTURE BUSINESS

There was a discussion of other topics that could potentially be relevant to the Academic Standards Subcommittee of the EPC. Including:

- Issues around the IELI credits policy
- The "significant feedback on the exam" and grades as related to the withdrawal policy.
- The inclusion of proficiency in ASL being credited, as would proficiency in other languages.

These three issues were retained for fall, 2014. A request for new issues/concerns will be circulated for the next meeting in the fall.

NEXT MEETING

The next meeting of the Academic Standards Subcommittee of the EPC will be fall, 2014.

Richard Mueller moved to approve the business of the Academic Standards Subcommittee. Eddy Berry seconded; motion approved.

Larry Smith suggested having an athletics representative on the Academic Standards subcommittee to discuss issues regarding missing tests and other items.

ISL issue – isn't being considered/credited. Test through languages but not ISL.

c. General Education Subcommittee (Norm Jones)

September 16, 2014, 8:30 A.M.
Champ Hall Conference Room

Present: Dean Adams, College of Engineering; Janet Anderson, Provost's Office; Eddy Berry, Social Sciences; Dan Coster, Quantitative Intensive; Brock Dethier, Writing Program; Doug Fiefia, USUAS President; Laura Gelfand; Caine College of the Arts; Norm Jones, Chair; Dawn Kirby, College of Humanities and Social Sciences; Harrison Kleiner, Connections; Kacy Lundstrom, Library; Brian McCuskey, Humanities; Kris Miller, Honors; Karen Mock, Natural Resources; Bob Mueller, Regional Campus; Dick Mueller, College of Science; Melanie Nelson, USU Eastern; Lauren Skousen, Secretary; Larry Smith, Provost's Office

Absent: Lawrence Culver, American Institutions; Kathy Chudoba, Business; Cindy Dewey, Creative Arts; Ryan Dupont, Life and Physical Sciences; Stephanie Hamblin, University Advising; Mary Leavitt, Advising; Shelley Lindauer, Emma Eccles Jones College of Education; John Mortensen, Student Services; Lee Rickords, College of Agriculture and Applied Sciences

Call to Order – Norm Jones

Approval of Minutes – August 19, 2014
Motion to approve made by Brian McCuskey; seconded by Laura Gelfand.

Course Approvals
MUSC 3030 (DHA).....Cindy Dewey
Motion to approve made by Laura Gelfand; seconded by Brian McCuskey. Approved.

Course/Designation Removals
N/A

Syllabi Approvals
HONR 1340 (BSS) ..... Eddy Berry
Motion to approve made by Eddy Berry; seconded by Richard Mueller. Maria Norton is the instructor of the approved syllabi. Approved.

NDFS 5230/6230 (CI)..... Brock Dethier
Motion to approve made by Brock Dethier; seconded by Eddy Berry. Heidi Wengreen is the instructor of the approved syllabi. Approved.

Business
Vote for Chair Elect 2015-2016
Prior to this meeting there was one nomination for chair elect: Dawn Kirby. Floor opened to other nominations. Motion to accept Dawn Kirby's nomination by acclamation made by Dick Mueller. All approved.
The Regents' General Education Task Force will hold the "What is an Educated Person XVII?": Building and Assessing the Whole Degree" Conference Oct. 30-31, 2014 at the Zermatt Resort, Midway, UT. Members of the Committee who are interested in attending should talk to Norm.

In the next few months, the National Institute for Outcomes Learning Assessment and the American Association of Colleges and Universities will publish profiles of USU's Gen Ed program as a model of what can be done to integrate Gen Ed into the curriculum.

After more than a decade of handling transfer and articulation issues in General Education, along with general curricular appeals, Norm is turning the job of enforcement over to our new Vice Provost, Janet Anderson. He will continue to handle appeals until October 1, after which they should be directed to Janet, Janet.anderson@usu.edu. All issues concerning policies and course approvals will continue to come to the Gen Ed Subcommittee of the EPC, which Norm continues to chair.

Kelly Fadel moved to approve the business of the General Education Subcommittee. Karen Mock seconded; motion approved.

Other Business

Faculty Senate will not have consent agenda items in this year's meeting. Oral reports will be made to the Faculty Senate.

Adjourned: 3:20 pm

Cover/Signature Page - Abbreviated Template/Abbreviated Template with Curriculum

Institution Submitting Request: *Utah State University*
Proposed Title:
Currently Approved Title:
School or Division or Location:
Department(s) or Area(s) Location: *Department of Computer Science, College of Engineering*
Recommended Classification of Instructional Programs (CIP) Code[1] (for new programs):
Current Classification of Instructional Programs (CIP) Code (for existing programs): *11.07*
Proposed Beginning Date (for new programs): *upon approval*
Institutional Board of Trustees' Approval Date:

Proposal Type (check all that apply):

Regents' General Consent Calendar Items		
R401-5 OCHE Review and Recommendation; Approval on General Consent Calendar		
SECTION NO.		ITEM
5.1.1	☐	Minor*
5.1.2	☐	Emphasis*
5.2.1	☐	(CER P) Certificate of Proficiency*
5.2.3	☐	(GCR) Graduate Certificate*
5.4.1	☐	New Administrative Unit
	☐	Administrative Unit Transfer
	☐	Administrative Unit Restructure
	☐	Administrative Unit Consolidation
5.4.2	☐	Conditional Three-Year Approval for New Centers, Institutes, or Bureaus
5.4.3	☐	New Center
	☐	New Institute
	☐	New Bureau
5.5.1	☐	Out-of-Service Area Delivery of Programs
5.5.2	☐	Program Transfer
	☒	Program Restructure
	☐	Program Consolidation
5.5.3	☐	Name Change of Existing Programs
5.5.4	☐	Program Discontinuation
	☐	Program Suspension
5.5.5	☐	Reinstatement of Previously Suspended Program
	☐	Reinstatement of Previously Suspended Administrative Unit

**Requires "Section V: Program Curriculum" of Abbreviated Template*

Chief Academic Officer (or Designee) Signature:
I certify that all required institutional approvals have been obtained prior to submitting this request to the Office of the Commissioner.
Signature Date: *09/04/2014*
Printed Name: *Nicholas S. Flann*

[1] CIP codes must be recommended by the submitting institution. For CIP code classifications, please see http://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55.

Program Request - Abbreviated Template
Utah State University
Ph.D. Computer Science
09/01/2014

Section I: Request

The Computer Science Department requests to reduce the total minimum number of credit hours required to complete a Ph.D. to 70 hours, a reduction from the current value of 90. The change is motivated by the desire to bring USU Computer Science in line with other Ph.D. programs within the College of Engineering and with other CS Ph.D. programs at peer institutions, which require no more than 72 hours. We anticipate that this change will increase the competitiveness and effectiveness of our PhD program while having a minimal impact on aggregate instructional activities since reductions in credit hours per student will be offset by an increasing PhD program and student enrollment in classes.

All numbers are minimum credit hours	Existing Ph.D. Program without MS	with MS	New Proposed Ph.D. program without MS	with MS
7000 level CS	12	12	9	9
Awarded from MS	0	30 (fixed)	0	0 to 30
Seminar CS7900	2	2	2	2
Dissertation	27	27	18	18
Additional courses	33	3	21	3
Remaining courses/dissertation			20	38 – (hours awarded from MS)
Minimum Total	90	90	70	70

There are three principal areas of change: a) the number of minimum dissertation credits is reduced by 9 hours, b) the minimum number of PhD classes is reduced by one class, c) satisfying the remaining credits needed becomes more flexible.

Section II: Need

Computer Science is one of the fastest growing job markets in the world, increasing the demand for graduates at BS, MS and PhD levels. New graduates in the USU CS department are experiencing multiple job offers at salaries higher than previous years. Significantly, this trend also applies to the PhD level principally because computer-related companies (such as Microsoft, Amazon, Google, Apple etc.) have growing internal research labs that seek PhDs to lead research and development of future products. Research shows that more than half of PhD graduates work in industry rather than academia (Taulbee Survey http://cra.org/resources/taulbee/))

According to the Computing Research Association annual Taulbee Survey, Computer Science programs around the country are producing more PhDs than ever before, but increasing demand has kept pace and this additional supply has not diminished employment or salary. Indeed, the Taulbee Survey reports an almost 100% placement and employment of PhDs in professional jobs. Salaries available from the Bureau of Labor Statistics (http://www.bls.gov/ooh/computer-and-information-technology/home.htm) give the median salary for computer research scientists at $100,800 and tenure-track assistant professors at $85,000 (for smaller public universities) and $100,000 (for large private universities).

In response to these rapid changes and positive future prospects the USU CS PhD program needs to modernize to become more competitive, efficient and tailored to current and future market conditions. The principal problem with the current program is that it takes too long to complete because of unnecessary and burdensome requirements. Specifically, the current minimum 90 credit hour requirement is outdated and exceptionally high compared to peer institutions within the intermountain region and around the country as summarized below (click on the university name to review the complete requirements, or follow the link in the next table):

University	Total	Min. Class	Min. Dissertation
University of Utah	50	27	14
BYU	66	48	18
Montana State Univ.	60	18	18
University of Nevada	72	30	24
Univ. of Pittsburgh	72	36	36
Virginia Commonwealth Univ.	70	42	18
UNC Charlotte	72	18	36
Iowa State Univ.	72	18	36

This reduction in credit hours to 70 brings the USU program into the range of peer institutions and combined with the new streamlined exam and student evaluation procedures (discussed below), will increase the effectiveness and PhD productivity of the department, but not diminish the quality of the PhD product. In fact, it is anticipated that a process more focused on productivity than credit hours will increase the quality of our PhDs.

University	Web link
University of Utah	http://www.cs.utah.edu/graduate/hb2013-14/gradhbk2013-14-phd_cs.html
BYU	https://cs.byu.edu/graduate-policy-handbook-phd-program
Montana State Univ.	http://www.cs.montana.edu/phd-courses.html
University of Nevada	http://www.unr.edu/degrees/computer-science-and-engineering/phd?view=requirements
Univ. of Pittsburgh	https://cs.pitt.edu/grad/phd.php
Virginia Commonwealth Univ.	http://www.pubapps.vcu.edu/Bulletins/graduate/?did=20281
UNC Charlotte	https://cci.uncc.edu/degree-requirements-current
Iowa State Univ.	https://www.cs.iastate.edu/graduate/cs_phd.php

In tandem with this proposed change, the CS department has implemented a new exam schedule (http://cs.usu.edu/htm/ph-d-examination-policy/) and is introducing a new annual evaluation policy of PhD student's productivity similar to the procedure for faculty evaluations. Students enter data describing their research, teaching and service contributions into a digital measure-like system and are then ranked using a published rubric. Student progress is reviewed by the departmental graduate committee and anonymized data is presented to the faculty, enabling faculty to identify poor and excellent students. The department then recognizes excellent students with awards during the annual graduate student reception. Students making unacceptable progress will be warned their first year and then if no improvement is made the second year, departmental support will be withdrawn.

Section III: Institutional Impact

It is anticipated that this change will enable the CS department to increase enrolment within the CS PhD program while maintaining or increasing admission standards because we will be offering a more competitive product.

No change in administrative structure will be required.

The CS department is growing in faculty and in students so it is anticipated that planned and actual new hires in faculty will fully support these proposed changes in the PhD program. No new staff will be needed. Current facilities will continue to be adequate.

Section IV: Finances

We anticipate no major cost increases or savings from this change.
In addition to those standard procedures in place for PhD and plan A MS students, faculty in the CS department include monies for tuition awards in their grant proposals as required by the COE.

Cover/Signature Page - Abbreviated Template/Abbreviated Template with Curriculum

Institution Submitting Request: Utah State University
Proposed Title: B.S. in Geology w/ Applied Environmental Geoscience Emphasis (new emphasis)
Currently Approved Title: B.S. in Applied Environmental Geoscience (to be discontinued)
School or Division or Location: College of Science
Department(s) or Area(s) Location: Geology
Recommended Classification of Instructional Programs (CIP) Code[2] (for new programs): 40.0601
Current Classification of Instructional Programs (CIP) Code (for existing programs): 40.0699
Proposed Beginning Date (for new programs): 01/07/2015
Institutional Board of Trustees' Approval Date:

Proposal Type (check all that apply):

Regents' General Consent Calendar Items		
R401-5 OCHE Review and Recommendation; Approval on General Consent Calendar		
SECTION NO.		ITEM
5.1.1	☐	Minor*
5.1.2	X	Emphasis*
5.2.1	☐	(CER P) Certificate of Proficiency*
5.2.3	☐	(GCR) Graduate Certificate*
5.4.1	☐	New Administrative Unit
	☐	Administrative Unit Transfer
	☐	Administrative Unit Restructure
	☐	Administrative Unit Consolidation
5.4.2	☐	Conditional Three-Year Approval for New Centers, Institutes, or Bureaus
5.4.3	☐	New Center
	☐	New Institute
	☐	New Bureau
5.5.1	☐	Out-of-Service Area Delivery of Programs
5.5.2	☐	Program Transfer
	☐	Program Restructure
	☐	Program Consolidation
5.5.3	☐	Name Change of Existing Programs
5.5.4	X	Program Discontinuation
	☐	Program Suspension
5.5.5	☐	Reinstatement of Previously Suspended Program
	☐	Reinstatement of Previously Suspended Administrative Unit

Chief Academic Officer (or Designee) Signature:
I certify that all required institutional approvals have been obtained prior to submitting this request to the Office of the Commissioner.

_____
Signature Date:

[2] CIP codes must be recommended by the submitting institution. For CIP code classifications, please see http://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55.

Program Request - Abbreviated Template
Utah State University
Bachelor of Science in Geology with an Applied Environmental Geoscience Emphasis
08/22/2014

Section I: Request

This request is to discontinue the current Bachelor of Science degree in Applied Environmental Geoscience and instead create an emphasis in Applied Environmental Geoscience in the existing Bachelor of Science degree in Geology.

Section II: Need

The Bachelor of Science (BS) in Applied Environmental Geoscience (AEG) has been in place for more than four years, but very few students have chosen to pursue this degree. From interviews with these students as well as other Geology majors, a serious concern that has been expressed is the value of the AEG degree, both in terms of its employability following graduation and its desirability for prospective graduate programs. Consequently, the Department of Geology at Utah State University has decided to discontinue the BS in AEG and instead offer an AEG emphasis in the existing BS in Geology due to the professional recognition of USU's Geology BS that already exists among both potential employers and other institutions of higher education that offer graduate degrees in the Earth and Geological Sciences.

Furthermore, because of concerns expressed by AEG majors during interviews regarding some of the elective courses for the BS in AEG, the Department of Geology has reassessed the curriculum and has made changes to the electives for the AEG emphasis in the BS in Geology that will make it more beneficial and attractive to students, and thus more enticing to potential majors. Please note, however, that the total number of credit hours required for both the BS in AEG and the AEG emphasis in the BS in Geology is exactly the same.

Finally, while the current AEG majors will be accommodated to allow completion of their degrees according to the existing requirements after the program is discontinued, all of the students interviewed have expressed their desire to switch to the AEG emphasis in Geology if it is approved for the reasons described above.

Section III: Institutional Impact

The proposed change is not anticipated to affect enrollments in any other instructional programs of affiliated departments or programs, nor will the proposed change affect any existing administrative structures. No changes in faculty or staff will be required, nor will any new physical facilities or modification to existing facilities be required. No equipment will need to be committed to initiate this change.

Section IV: Finances

The proposed change is not anticipated to result in any costs or savings to the Geology Department, College of Science, or Utah State University, nor are any budgetary impacts on other programs or units within Utah State University anticipated.

Section V: Program Curriculum

All Program Courses (with New Courses in Bold)

Course Prefix and Number	Title	Credit Hours
Required Courses	GEO 1110 - Physical Geology	3
	GEO 1115 - Physical Geology Laboratory	1
	GEO 3200 - Earth Through Time	4
	GEO 3500 - Minerals and Rocks	4
	GEO 3550 - Sedimentation and Stratigraphy	4
	GEO 3600 - Geomorphology	4
	GEO 3700 - Structural Geology	4
	GEO 4700 - Geologic Field Methods	3
	GEO 5200 - Geology Field Camp	5
	GEO 5600 - Geochemistry	3
	CHEM 1210 - Principles of Chemistry I	4
	CHEM 1215 - Principles of Chemistry Lab I	1
	CHEM 1220 - Principles of Chemistry II	4
	CHEM 1225 - Principles of Chemistry Lab II	1
	MATH 1210 - Calculus I	4
	STAT 3000 - Statistics for Scientists	3
	PHYS 2210 - Physics for Sci and Engr I	4
	PHYS 2215 - Physics for Sci and Engr Lab I	1
	BIOL 1610 - Biology I	4
	BIOL 1620 - Biology II	4
	GEOG 1800 - Intro to GIS	3
	Sub-Total	68
Elective Courses	PSC 3000 - Fundamentals of Soil Sci **and**	4
	PSC 5130 – Soil Genesis, Morph, and Class	4
	OR	
	WATS 3700 – Fund of Watershed Sci **and**	3
	WATS 4490 – Small Watershed Hydrology	4
	GEO 5630 – Geologic Image Analysis **or**	3
	WATS 4930 – Adv GIS and Spatial Anal **or**	3
	WATS 5003 – Remote Sensing Land Surf **or**	4
	WILD 5750 – Applied Remote Sensing	3
	BIOL 2220 – General Ecology **or**	3
	CHEM 3650 – Environmental Chemistry **or**	3
	PSC 3820 – Climate and Climate Change	3
	Sub-Total	13 - 15
Track/Options (if applicable)		
	Sub-Total	
*(This is the same number of credits as the BS in AEG)	Total Number of Credits	81 - 83

Program Schedule

Freshman Year

Fall Semester (13 credits)

GEO 1110 - Physical Geology (3)
GEO 1115 - Physical Geology Laboratory (1)
CHEM 1210 - Principles of Chemistry I (4)
CHEM 1215 - Principles of Chemistry Laboratory I (1)
MATH 1210 - Calculus I (4)

Spring Semester (13 credits)

GEO 3200 - Earth Through Time (4)
GEO 3500 - Minerals and Rocks (4)
CHEM 1220 - Principles of Chemistry II (4)
CHEM 1225 - Principles of Chemistry Laboratory II (1)

Sophomore Year

Fall Semester (13 credits)

GEO 3550 - Sedimentation and Stratigraphy (4)
PHYS 2210 - Physics for Science and Engineering I (4)
PHYS 2215 - Physics for Science and Engineering Laboratory I (1)
BIOL 1610 - Biology I (4)

Spring Semester (14 credits)

GEO 3700 - Structural Geology (4)
GEO 5600 - Geochemistry (3)
BIOL 1620 - Biology II (4)
STAT 3000 - Statistics for Scientists (3)

Junior Year

Fall Semester (10 credits)

GEO 3600 - Geomorphology (4)
GEO 4700 - Geologic Field Methods (3)
GEOG 1800 - Introduction to Geographic Information Systems (3)

Spring Semester (6 - 7 credits)

PSC 3000 - Fundamentals of Soil Science (4) or
WATS 3700 - Fundamentals of Watershed Science (3)
BIOL 2220 - General Ecology (3) or
CHEM 3650 - Environmental Chemistry (3) or
PSC 3820 - Climate and Climate Change (3)

Summer Semester (5 credits)

GEO 5200 - Geology Field Camp (5)

Senior Year

Fall Semester (0 - 7 credits)

PSC 5130 - Soil Genesis, Morphology, and Classification (4) (if PSC 3000 taken in previous spring)
WILD 5750 - Applied Remote Sensing (3) (if neither WATS 4930 nor WATS 5003 taken in following spring)

Spring Semester (0 - 8 credits)

WATS 4490 - Small Watershed Hydrology (4) (if WATS 3700 taken in previous spring)
WATS 4930 - Advanced GIS and Spatial Analysis (3) or
WATS 5003 - Remote Sensing of Land Surfaces (4) (if WILD 5750 not taken in fall)

Cover/Signature Page – Full Template

Institution Submitting Request: Utah State University
Proposed Title: PhD Degree in Aerospace Engineering
School or Division or Location: College of Engineering
Department(s) or Area(s) Location: Mechanical and Aerospace Engineering
Recommended Classification of Instructional Programs (CIP) Code[3] : 14.0201
Proposed Beginning Date: 08/01/2015
Institutional Board of Trustees' Approval Date: MM/DD/YEAR

Proposal Type (check all that apply):

Regents' Agenda Items		
R401-4 and R401-5 Approval by Committee of the Whole		
SECTION NO.		ITEM
4.1.1	☐	(AAS) Associate of Applied Science Degree
4.1.2	☐	(AA) Associate of Arts Degree
	☐	(AS) Associate of Science Degree
4.1.3	☐	Specialized Associate Degree
4.1.4	☐	Baccalaureate Degree
4.1.5	☐	K-12 School Personnel Programs
4.1.6	☐	Master's Degree
4.1.7	X	Doctoral Degree
5.2.2	☐	(CER C) Certificate of Completion
5.2.4	☐	Fast Tracked Certificate

Chief Academic Officer (or Designee) Signature:
I certify that all required institutional approvals have been obtained prior to submitting this request to the Office of the Commissioner.

_____
Signature Date:

Printed Name:

R 401 Executive Summary
Utah State University
PhD Degree in Aerospace Engineering
Department of Mechanical and Aerospace Engineering
August 2014

Program Description

The Department of Mechanical and Aerospace Engineering (MAE) at USU seeks to offer a new PhD (Doctor of Philosophy) degree program in Aerospace Engineering to complement the current MS in Aerospace Engineering and the current MS and PhD programs in Mechanical Engineering. Aerospace Engineering is the primary branch of engineering associated with design, construction, testing, and technology development for all types of flying vehicles including airplanes, rockets, missiles, and spacecraft. Currently, the PhD in Mechanical Engineering degree is being used to accommodate both mechanical and aerospace engineering graduate students who successfully complete the Mechanical Engineering doctoral program. The proposed new degree program will establish a separate degree path for aerospace engineering graduate students and attract new students that specifically desire a PhD graduate degree in Aerospace Engineering. This can be accomplished without any change to our current faculty, staff, and coursework.

Role and Mission Fit

The proposed PhD graduate degree program in Aerospace Engineering is consistent with the role of USU as set forth in Regent's Policy R312. The PhD in Aerospace Engineering will support the Regent's mission for a doctoral granting institution "*through discovery, creation, and transmission of knowledge through a graduate educational program."* More specifically, Regent's Policy R312-4.1.2 states that "*the mission of Utah State University is to be one of the nation's premier student centered land grant and space grant universities by fostering the principle that academics come first; by cultivating diversity of thought and culture; and by serving the public through learning, discovery, and engagement.*" Additionally, the proposed program is complementary to ongoing research at the Space Dynamics Lab (SDL). In a letter of support from the USU Research Foundation (USURF), President Scott Hinton states that *"USURF and SDL would welcome and encourage an Aerospace PhD at USU. We think that the program you are proposing would complement and support much of the work that is the core of SDL's business."*

Faculty

The MAE department has 16 tenured and tenure-track faculty members, all with doctoral degrees. Eight faculty members, including four with doctoral degrees in Aerospace Engineering, have expertise directly related to the proposed aerospace engineering program as well as current research projects in aerospace that will support the proposed PhD degree program.

Labor Market Demand

Nearly 80,000 engineers are currently employed in aerospace, significantly higher than the number employed in computer hardware, nuclear engineering, biomedical engineering or chemical engineering, among other fields. (IEEE, http://www.todaysengineer.org/2012/may/career-focus.asp) Over the decade from 2012 to 2022, the Bureau of Labor Statistics projects a 7% growth in employment for aerospace engineers. Overall, Utah is one of the top ten states in the nation in the concentration of aerospace employment. Given the large

concentration of aerospace industries in Utah, USU graduates with a PhD in aerospace engineering will clearly be "first in line" to fill these available high-paying positions; keeping "home-grown" talent "close to home."

Student Demand

Presently the MAE department supports a PhD in Mechanical Engineering. A new PhD in Aerospace Engineering will provide graduate students with an option that is more focused on the specialized topics that are central to aerospace engineering. Graduates with a PhD in aerospace engineering will be better prepared and more competitive in the aerospace industry. Students wanting a PhD degree in aerospace engineering will be able to stay in Utah rather than go out of state. As stated previously, this change will help to keep home-grown talent close to home.

When the PhD in Aerospace Engineering program is approved, there exists a potential for an initial small decrease in the number of students pursuing a PhD in Mechanical Engineering. However, because of the previously-described market demand and the desire of many students to choose a program with a PhD in Aerospace Engineering, overall enrollment is in MAE's PhD programs is projected to increase during the next five years.

Statement of Financial Support

Indicate from which of the following the funding for this new degree program will be generated:

- Legislative Appropriation ..... ☐
- Grants..... ☒
- Reallocated Funds..... ☒
- Tuition dedicated to the program ..... ☐
- Other ..... ☒

The MAE's full-time PhD graduate students receive graduate research or graduate teaching assistantships to help finance their education. All of the research assistantships are supported by grants and contracts initiated by the faculty. These grants and contracts also provide research equipment, materials, and supplies used by the students in their courses and research associated with the PhD degree.

Similar Programs Already Offered in the USHE

Currently, there no Aerospace Engineering PhD degree within the Utah System of Higher Education. Thus, offering the Aerospace PhD degree better positions USU to capture regional talent that would otherwise leave the state. A flourishing PhD program in aerospace engineering will likely attract students who would not have previously considered USU.

R 401 Proposal
PhD Degree in Aerospace Engineering
Department of Mechanical and Aerospace Engineering
Utah State University

Section I: The Request

Utah State University (USU) requests approval to offer the Doctor of Philosophy degree in Aerospace Engineering effective Fall Semester 2015. The program has been approved by the institutional Board of Trustees on xx.

Section II: Program Description

Overview

The Department of Mechanical and Aerospace Engineering (MAE) at USU seeks to offer a new PhD (Doctor of Philosophy) degree program in Aerospace Engineering to complement the current MS in Aerospace Engineering and the current MS and PhD programs in Mechanical Engineering. Aerospace Engineering is the primary branch of engineering associated with design, construction, testing, and technology development for all types of flying vehicles including airplanes, rockets, missiles, and spacecraft. Currently, the PhD in Mechanical Engineering degree is being used to accommodate both mechanical and aerospace engineering graduate students who successfully complete the Mechanical Engineering doctoral program. The proposed new degree program will establish a separate degree path for aerospace engineering graduate students and attract new students that specifically desire a PhD graduate degree in Aerospace Engineering. MAE offers sufficient foundation and aerospace courses that provide the breadth and depth needed for a quality aerospace PhD degree program without the need to develop any new courses.

PhD Degree Requirements

The PhD degree requires 72 credit hours beyond the bachelor's degree and 42 credit hours beyond the Master's degree and will comply with all Graduate School requirements for PhD programs of study including a formal dissertation. All students must pass 3 PhD Qualifier Exams, a dissertation proposal defense, and a final dissertation defense. PhD degree requirements also consists of core courses (5000-, 6000-, and 7000-level) in aerospace engineering, advanced mathematics, technical electives, and quality aerospace research. A summary of PhD degree requirements is provided below.

Aerospace Engineering (PhD) Degree Requirements

Beyond the BS - 72 credits

Coursework*:

24 credits (minimum) Aerospace Core
- must include MAE 5500 and 5560 if not previously completed

21 credits (minimum) Aerospace Electives/Other
- No more than 6 credits MAE 7930 Doctoral Publications
- No more than 6 credits MAE 5930/6930/7930 Independent Study courses.

Beyond the MS - 42 credits

Coursework*:

12 credits (minimum) Aerospace Core
- must include MAE 5500 and 5560 if not previously completed

6 credits (minimum) Aerospace Electives/Other
- No more than 6 credits MAE 7930 Doctoral Publications
- No more than 6 credit MAE 5930/6930/7930 Independent Study courses.

6 credits advanced math	3 credits advanced math
Dissertation Research 21 credits MAE 7970	Dissertation Research 21 credits MAE 7970
Dissertation Proposal & Final Defense	Dissertation Proposal & Final Defense
*No more than 21 credits of 5000- level coursework	*No more than 15 credits of 5000- level coursework

Purpose of the Degree

The new degree program will attract new PhD students to the MAE graduate studies and research program and provide graduate students with the opportunity to receive a degree more directly aligned with the academic and research skills that are critical to the aerospace industry. Students completing this degree program will possess skills sought by research organizations in industry, government, and academia requiring advanced design, research, and technical management in aerospace engineering. The PhD in Aerospace Engineering will support the Utah-based aerospace industry, as well as other prominent regional and national aerospace companies and research laboratories.

Institutional Readiness

The new degree program will be administered by the MAE Department, which has in place the administrative infrastructure necessary to manage the program. There is a graduate committee that oversees the graduate programs and a full-time staff member assigned to the graduate program. Presently, the MAE department supports a PhD program in Mechanical Engineering. The PhD program in Aerospace Engineering will place more emphasis on core aerospace engineering coursework, but will not require additional institutional resources or the development of new courses. In a very real sense, the level of effort and cost to administer this degree program will be the same as that already being accomplished for the Mechanical Engineering PhD degree.

Faculty

Eight faculty members in MAE have appropriate backgrounds and research interests in aerospace engineering to support the program. In the past, these faculty members have supported the MS program in Aerospace Engineering and a degree specialization in aerospace under the MS program in mechanical engineering.

Professors:

Christine Hailey - PhD Mechanical Engineering, University of Oklahoma, 1985 (aerodynamics and flight mechanics)

Associate Professors:

Rees Fullmer – PhD Mechanics Engineering, University of Utah, 1985 (guidance, navigation and control)
Steven Folkman - PhD Mechanical Engineering, Utah State University, 1990 (aerospace structures)
David Geller - PhD Space Physics and Astronomy, Rice University, 1999 (guidance, navigation and control)
Steven Whitmore - PhD Aerospace Engineering, University of California, Los Angeles, 1989 (flight mechanics and propulsion)

Assistant Professors:

Aaron Katz - PhD Aeronautics and Astronautics, Stanford University, 2009 (computational fluid dynamics)

Currently two additional faculty positions are being filled at the assistant professor level to support the needs of the Aerospace Engineering curriculum.

Staff

Additional staff lines will not be required. The current resources within the Department of Mechanical and Aerospace Engineering will be able to accommodate this new program.

Library and Information Resources

Two major library resources needed for the new program are the IEEE Xplore database and a series of journals produced by the American Institute of Aeronautics and Astronautics. The Merrill-Cazier library presently subscribes to these resources. See attached letter from the Merrill-Cazier Library.

Admission Requirements

Applicants with a bachelor's or master's degree in Aerospace Engineering or Mechanical Engineering from an ABET-accredited program can apply. For unrestricted admission to the program, students are required to have a minimum 3.3 GPA and successfully pass the GRE exam. The subject GRE is not required. Additional coursework in aerospace engineering fundamentals may be required in individual cases. All graduate students are expected to have a working knowledge of a computer programming language.

Student Advisement

The mechanics of admission to the programs and fulfilling program requirements are handled by our full-time staff graduate advisor. As students are admitted to the program, they are assigned a temporary faculty advisor who guides them on which courses to take the first semester and how to prepare for the PhD Qualification Exams. During the first semester, students select a graduate committee and a major professor who advise them throughout the rest of their program.

Justification for the Number of Credits

The number of credits required for this program is the same as the currently offered PhD in Mechanical Engineering which is overseen by the Graduate School.

External Review and Accreditation

As with the current PhD program in Mechanical Engineering and practice throughout the United States, no accreditation will be sought.

Projected Enrollment

Table 1. Projected enrollment for the PhD Aerospace Engineering Degree.

Year	Student FTE	Student Headcount	# of Faculty	Mean FTE-to-Faculty Ratio
1	4	4	8	0.50
4	6	6	8	0.75
3	8	8	8	1.00
4	9	9	8	1.13
5	10	10	8	1.25

Section III: Need

Program Need

Within the intermountain region, only Arizona State University, University of Arizona, and the University of Colorado at Boulder offer PhD programs in Aerospace Engineering. There are no Aerospace Engineering PhD degree programs in Wyoming, Nevada or Idaho, or within the Utah System of Higher Education (USHE). Thus, offering the Aerospace PhD degree better positions USU to capture regional talent that would otherwise leave the state. A flourishing PhD program in aerospace engineering will likely attract students who would not have previously considered USU.

Labor Market Demand

Nearly 80,000 engineers are currently employed in aerospace, significantly higher than the number employed in computer hardware, nuclear engineering, biomedical engineering or chemical engineering, among other fields. (IEEE, http://www.todaysengineer.org/2012/may/career-focus.asp) According to the U.S. Department of Labor, Bureau of Labor Statistics, aerospace engineers are expected to have a 7% growth in employment during the decade of 2012 to 2022.

Overall, Utah is one of the top ten states in the nation in the concentration of aerospace employment. In 2011, the Economic Development Corporation of Utah listed the leading aerospace organizations in Northern Utah. Largest amongst these organizations is Hill Air Force Base (HAFB) located just south of the city of Ogden, and near the towns of Clearfield, Riverdale, Roy, Sunset, and Layton. HAFB is the host unit for the USAF Material Command's 75th Air Base Wing. This unit provides support for the Ogden Air Logistics Complex (OALC) and its subordinate organizations. The OALC is the worldwide manager for a wide range of aircraft, engines, missiles, software, avionics, and accessories components. The largest private employer is Alliant Technology Systems (ATK) with the Space Systems Division groups located in Magna and Promontory, and its Aerospace Structures Division in Clearfield.
These large-scale employers are supported by a significant group of medium-sized employers including Aircraft and Space Defense Groups of Moog Inc., the Parker-Hannifin Corporation, Boeing Utah Company, and the Northrop Grumman Space and Missile Systems Group, all of Layton, Utah.

The Space Dynamics Laboratory, North Logan, Utah is a University Affiliated Research and Development Center (UARC) and a sub-unit of the Utah State University Research Foundation (USURF). It is a medium-sized non-commercial employer of aerospace engineers. SDL expects to continue to hire new PhD aerospace engineers as they have done for the past 50 years, and it would be to SDL's advantage if these PhD engineers were "home-grown" right in their own backyard.

Multiple small private supplier and integration organizations provide to this network of large-to medium scale employers. Examples of these small support vendors include Compositex, Inc., Sandy, Utah, a manufacturer of rocketry cases and nozzles; Groen Brothers Aviation Global, Inc., Salt lake City, Utah, a designer of high-performance rotorcraft for both civil and military applications; Borsight, Inc., Ogden, Utah, an aerospace systems integrator; and Hypercomp, Inc., Brigham City, Utah, a manufacturer of composite pressure vessels.

Despite the changing environment of the aerospace industry, where NASA's operations have scaled back significantly, demand for aerospace engineers by private, commercial, and national defense employers is still strong. Over the decade from 2012 to 2022, the Bureau of Labor Statistics projects a 7% growth in employment for aerospace engineers. This growth is primarily driven by two emerging markets 1) unmanned aerial vehicle (UAV) and their integration into civil airspace, and 2) commercial space ventures both crewed and robotic. These emerging markets will require the creation and development of a wide swath of highly specialized technologies in order to become viable, and will clearly support a large pool of employees with

advanced aerospace engineering degrees. Given the large concentration of aerospace industries in Utah, USU graduates with a PhD in aerospace engineering will clearly be "first in line" to fill these high-paying positions; keeping "home-grown" talent "close to home." USU and SDL already host the annual "SmallSAT" international conference on small spacecraft technologies; and the introduction of the PhD degree in Aerospace Engineering will better position Utah State to become the de facto leader of small spacecraft world.

Student Demand

Presently the MAE department supports a PhD in Mechanical Engineering. A new PhD in Aerospace Engineering will provide graduate students with an option that is more focused on the specialized topics that are central to aerospace engineering. Graduates with a PhD in aerospace engineering will be better prepared and more competitive in the aerospace industry. Students wanting a PhD degree in aerospace engineering will be able to stay in Utah rather than go out of state. As stated previously, this change will help to keep home-grown talent close to home.

When the PhD in Aerospace Engineering program is approved, there exists a potential for an initial small decrease in the number of students pursuing a PhD in Mechanical Engineering. However, because of the previously-described market demand and the desire of many students to choose a program with a PhD in Aerospace Engineering, overall enrollment is in MAE's PhD programs is projected to increase during the next five years.

Section IV: Impact and Benefits

Collaborations with and Impact on Other USHE Institutions

There will be no impact on other USHE institutions.

Benefits

The PhD in Aerospace Engineering will directly impact the goals of the USHE to prepare a workforce and develop advanced aerospace technologies that will directly impact Utah's economy. This proposed degree will make USU graduates more competitive for aerospace engineering positions within Utah as well as elsewhere in the aerospace industry. By having more engineers educated and trained for their needs, the Utah aerospace companies are, presumably, going to be more competitive in competing for new contracts and developing new aerospace technologies.

Consistency with Institutional Mission

The mission of USU is to be one of the nation's premier student-centered land-grant and space-grant universities by fostering the principle that academics come first, by cultivating diversity of thought and culture, and by serving the public through learning, discovery, and engagement.

The proposed PhD in Aerospace Engineering enhances the University's reputation as a space-grant institution through both its graduates and research productivity. It supports the University Mission Statement in the following ways:

1. The department becomes more student-centered by providing a program to meet the needs of the students.

2. The doctoral program will improve academics in aerospace engineering by fostering research in the forefront of the field, consistent with the USU mission to be one of the nation's premier space-grant universities.

The doctoral program will serve the public by application of the research produced. It will also serve the growing aerospace industry in Utah with a better-prepared work force.

Section V: Program and Student Assessment

Program Assessment

The major goal for the program is to graduate PhD students with expertise in aerospace engineering and who are prepared to meet the needs of research organizations in industry and academia. Attainment of this goal will be measured by the placement rate of graduates within local and national research laboratories in industry, government, and academia.

Expected Standards of Performance

The standard of performance for all students is a grade of C or better in all classes required for the degree and to maintain an overall program GPA of 3.0 or higher in order to graduate with a PhD degree. In addition, all PhD students must satisfactorily pass a set of qualification exams within 3 semesters of being admitted to the aerospace engineering PhD program, and pass a dissertation defense upon completion of their dissertation research. PhD students are also expected to publish in peer-reviewed journals before completing their PhD program of study. These standards are already well established in the Graduate School as well as for the existing Mechanical Engineering PhD degree program.

Section VI: Finances

Funding Sources

The proposed PhD in Aerospace Engineering builds on MAE's MS in Aerospace Engineering Program and the aerospace specialization in place within MAE's undergraduate program. Additional funding is not required.

Reallocation

No budget transfers or reallocations will be requested or needed to offer a quality program as explained in the next section.

Impact on Existing Budget

A new aerospace PhD degree will enhance the MAE graduate program with virtually no impact on existing budgets.

Faculty: This new degree will have no impact on faculty salaries since new faculty positions are not needed to offer the degree. In reality, each professor is constantly managing his/her time to maintain a research program that includes preparing proposals, contract management, student mentoring, teaching courses, publishing research results, and providing University and professional service. Experience has shown that even though the required student contact time increases with the number of graduate advisees, the overall workload may not increase but actually decrease because there is more graduate student support for developing and maintaining the research productivity. The MAE Faculty feels that the benefits of the projected enrollment offset the time costs to manage the program.

Staff: This new degree program will have no impact on staff work load and staff salaries.

Facilities: During the past five years, the MAE department has been planning for and working toward increased graduate enrollment and has sufficient office/study space to accommodate the expected small enrollment increase. Most of the incidental cost associated with graduate students is already covered by the research grants/contracts and F&A return such that the impact on E&G funds is essentially zero.

Operating Costs: Increase in enrollment results in increased copy service charges and other miscellaneous expenses. MAE has already been using electronic communications more and more to curb paper and copy expenses. This will continue such that these costs will be minimal for this degree program. In summary, the additional work load imposed by this degree is minimal and will have no impact on tasks that would normally be done by current faculty and staff.

Budget Explanation: Salaries, wages, and benefits represent the expenses associated with teaching the courses for the new PhD Aerospace program. Since these courses are already being taught, the revenue to pay for these expenses is simply a reallocation within current department funds. Thus, the difference, revenue less expenses, is zero. The teaching expenses are based on eight faculty members with an approximately 50% teaching role assignment, and with a 50/50 split between mechanical engineering courses and aerospace engineering courses. The expenses are thus approximately 25% of our current salaries, wages, and benefits for these faculty members. Note that any additional expenses associated with research will be externally funded.

Comments for Table 2:

- FTE = 10 credits
- Tuition increase is estimated at 8%.
- Salary and Wages increase is estimated at 3%.
- Benefit increase follows the Sponsored Programs rates
- No new funding is required for this program.

Table 2. Projected Aerospace PhD Program Revenue and Expenses

		Year 1	Year 2	Year 3	Year 4	Year 5
Students						
	Projected FTE	4	6	8	9	10
	Cost Per FTE	12,173	10,843	9,811	9,455	9,139
	Student/Faculty Ratio	0.50	0.75	1.00	1.13	1.25
Projected Tuition						
	Gross Tuition	21,897	35,473	51,081	62,063	74,476
	Tuition to Program	0	0	0	0	0
5 Year Budget Projection						
		Year 1	Year 2	Year 3	Year 4	Year 5
Expenses						
	Salaries & Wages					
	Benefits					

	Total Personnel	N/A – All costs are currently covered in existing programs. There are no additional faculty or staff FTE, library or other operational funds required				
	Current Expense					
	Travel					
	Capital					
	Library Expense					
Total Expense						
Revenue						
	Legislative Appropriation					
	Grants	N/A – Funded through existing resources				
	Reallocation					
	Tuition to Program					
	Fees					
Total Revenue						
Difference	Revenue-Expense	0	0	0	0	0

Appendix A: Program Curriculum

All Program Courses

PhD Beyond BS

Course Requirements	Credit Hours (minimum)
Core Courses	24
Math Courses	6
Dissertation Research	21
Technical electives/other credits	21
Total Credits	72

PhD Beyond MS

Course Requirements	Credit Hours (minimum)
Core Courses	12
Math Course	3
Dissertation Research	21
Technical electives/other credits	6
Total Credits	42

Existing Aerospace Core Courses

Fall Semester

- MAE 5500 Aerodynamics
- MAE 5560 Dynamics of Space Flight
- MAE 6500 Potential Flow
- MAE 6510 Aircraft Dynamics and Flight Simulation
- MAE 6540 Advanced Astrodynamics
- MAE 7540 Advanced Astrodynamics Techniques/Applications

Spring Semester

- MAE 6340 Spacecraft Attitude Control
- MAE 6560 Spacecraft Navigation
- MAE 6930 Advanced Control of Aero Vehicles

Summer Semester

- MAE 6530 Advanced Propulsion
- MAE 6570 Optimal Space Guidance
- MAE 6930 Monte Carlo and Linear Covariance Techniques
- MAE 7560 Optimal Estimation/Aerospace

Aerospace Technical Electives

Fall Semester

- MAE 5310 Dynamic Systems and Controls
- MAE 5420 Compressible Fluid Flow
- MAE 6180 Dynamics & Vibrations
- MAE 6410 Fluid Dynamics

MAE 7360 Optimal and Robust Control
MAE 6320 Linear Multivariable Control
ECE 5230 Space Systems Engineering
ECE 6240 Space Environment Engineering
ECE 6650 Optics I

Spring Semester

MAE 5440 Computational Fluid Dynamics
MAE 5510 Dynamics of Atmospheric Flight
MAE 5540 Propulsion Systems
MAE 6440 Advanced Computational Fluid Dynamics
MAE 6490 Turbulence*
MAE 6550 Advanced Structural Analysis
MAE 7330 Nonlinear and Adaptive Control
MAE 7350 Intelligent Control Systems

All Semesters (Fall, Spring, and Summer)

MAE 5930, 6930, 7930 Special Topics (must be Aero focused)

Approved Mathematics Courses

a. MATH 5270: Complex Variables
b. MATH 5410: Methods of Applied Mathematics
c. MATH 5420: Partial Differential Equations
d. MATH 5460: Introduction to Theory and Application of Nonlinear Dynamics Systems
e. MATH 5760: Stochastic Processes
f. MATH 6270: Complex Variables
g. MATH 6410: Ordinary Differential Equations I
h. MATH 6420: Partial Differential Equations I
i. MATH 6440: Ordinary Differential Equations II
j. MATH 6450: Partial Differential Equations II
k. MATH 6470: Advanced Asymptotic Methods
l. MATH 6610: Numerical Analysis
m. MATH 6620: Numerical Analysis
n. MATH 6640: Optimization
o. ECE 6010: Stochastic Processes in Electronic Systems
p. ECE 6030: Mathematical Methods for Signals and Systems
q. STAT 5200 Design of Experiments
r. MAE 7560 Optimal Estimation for Aerospace Systems

New Courses to be Added in the Next Five Years

No new courses are currently planned. However, to enhance the program and continually strengthen its relevance, it is expected that new courses will be integrated over time into the program using well established practices.

Appendix B: Program Schedule

The following is a sample program of study for the Aerospace Engineering PhD beyond the BS.

PhD Aerospace Engineering (Year 1)			Yr 1 Credits
Fall 1	Spring 1	Summer 1	
MAE 5500	MAE 6340	MAE 6530	
MAE 5560	MAE 5540[1]		
MAE 5420[1]	MAE 5440[1]		
9 hours	9 hours	3	21

[1] Technical Elective

PhD Aerospace Engineering (Year 2)			Yr 2 Credits
Fall 2	Spring 2	Summer 2	
MAE 6500	MAE 6560	MAE 6570	
MAE 6540	Math 5420		
MAE 5310[1]	MAE 6440[1]		
9 hours	9 hours	3 hours	21

[1] Technical Elective

PhD Aerospace Engineering (Year 3)			Yr 3 Credits
Fall 3	Spring 3	Summer 3	
MAE 6410[1]	MAE 7970	MAE 7560[m]	
ECE 5230[1]			
6 hours	9 hours	3 hours	18

[1] Technical Elective [m] Math Course

PhD Aerospace Engineering (Year 4)			Yr 4 Credits
Fall 4	Spring 4	Summer 4	
MAE 7970	MAE 7970		
6 hours	6 hours		12
		Total Credits	72

The following is a sample program of study for the Aerospace Engineering PhD beyond the MS.

PhD Aerospace Engineering (Year 1)			Yr 1 Credits
Fall 1	Spring 1	Summer 1	
MAE 5500	MAE 6340	MAE 6530	
MAE 5560	MAE 5540[1]		
MAE 5420[1]	MATH 5420		
9 hours	9 hours	3	21

[1] Technical Elective

PhD Aerospace Engineering (Year 2)			Yr 2 Credits
Fall 2	Spring 2	Summer 2	
MAE 7970	MAE 7970		
6 hours	6 hours		12

[1] Technical Elective

PhD Aerospace Engineering (Year 3)			Yr 3 Credits
Fall 3	Spring 3	Summer 3	
MAE 7970	MAE 7970		
6 hours	3 hours		9
		Total Credits	42

Appendix C: Faculty

Professors:

Christine Hailey - PhD Mechanical Engineering, University of Oklahoma, 1985 (aerodynamics and flight mechanics)

Associate Professors:

Rees Fullmer – PhD Mechanics Engineering, University of Utah, 1985 (guidance, navigation and control)
Steven Folkman - PhD Mechanical Engineering, Utah State University, 1990 (aerospace structures)
David Geller - PhD Space Physics and Astronomy, Rice University, 1999 (guidance, navigation and control)
Steven Whitmore - PhD Aerospace Engineering, University of California, Los Angeles, 1989 (propulsion)

Assistant Professors:

Aaron Katz - PhD Aeronautics and Astronautics, Stanford University, 2009 (computational fluid dynamics)

Currently two additional faculty positions are being filled at the assistant professor level to support the needs of the Aerospace Engineering curriculum.

Cover/Signature Page - Abbreviated Template/Abbreviated Template with Curriculum

Institution Submitting Request: Utah State University
Proposed Title: B.S. in Biology with Human Biology Emphasis (new emphasis)
Currently Approved Title: NA
School or Division or Location: College of Science
Department(s) or Area(s) Location: Department of Biology
Recommended Classification of Instructional Programs (CIP) Code[1] (for new programs): 29.9999
Current Classification of Instructional Programs (CIP) Code (for existing programs): NA
Proposed Beginning Date (for new programs): 08/01/2014
Institutional Board of Trustees' Approval Date:

Proposal Type (check all that apply):

Regents' General Consent Calendar Items		
R401-5 OCHE Review and Recommendation; Approval on General Consent Calendar		
SECTION NO.		ITEM
5.1.1	☐	Minor*
5.1.2	X	Emphasis*
5.2.1	☐	(CER P) Certificate of Proficiency*
5.2.3	☐	(GCR) Graduate Certificate*
5.4.1	☐	New Administrative Unit
	☐	Administrative Unit Transfer
	☐	Administrative Unit Restructure
	☐	Administrative Unit Consolidation
5.4.2	☐	Conditional Three-Year Approval for New Centers, Institutes, or Bureaus
5.4.3	☐	New Center
	☐	New Institute
	☐	New Bureau
5.5.1	☐	Out-of-Service Area Delivery of Programs
5.5.2	☐	Program Transfer
	☐	Program Restructure
	☐	Program Consolidation
5.5.3	☐	Name Change of Existing Programs
5.5.4	☐	Program Discontinuation
	☐	Program Suspension
5.5.5	☐	Reinstatement of Previously Suspended Program
	☐	Reinstatement of Previously Suspended Administrative Unit

**Requires "Section V: Program Curriculum" of Abbreviated Template*

Chief Academic Officer (or Designee) Signature:
I certify that all required institutional approvals have been obtained prior to submitting this request to the Office of the Commissioner.

_____
Signature Date: *MM/DD/YEAR*

Printed Name: *Name of CAO or Designee*

[1] CIP codes must be recommended by the submitting institution. For CIP code classifications, please see http://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55.

Program Request - Abbreviated Template
Utah State University
Bachelor of Science in Biology with a Human Biology Emphasis
10/22/2014

Section I: Request

This document requests a new Human Biology Emphasis be added to the existing Bachelor of Science degree in Biology.

Section II: Need

There is student demand for a biology curriculum tailored to the interests of students wishing to pursue health-related careers. Many of these students are no longer pursuing biology majors. By creating a curriculum that continues to provide a strong grounding in biological sciences but with special emphasis in human-related areas, the Department of Biology will attract and retain some of the best and brightest undergraduates. An important feature of the Human Biology Emphasis is that because it retains strength in the basic sciences, students who ultimately decide to pursue careers outside the health professions will still be well-prepared for graduate school or employment in basic or biomedical sciences.

The Human Biology emphasis for the Bachelor's degree in Biology is designed to increase elective flexibility while maintaining rigor. The Human Biology emphasis prepares students for professional schools by teaching them to be scientists, but also broadens their understanding of the human condition. Inclusion of social science and humanities requirements more closely aligns the Human Biology emphasis with new professional school admission requirements. For example, starting in 2015, the Medical College Admission Test (MCAT) will give equal weight to testing biological, biochemical, chemical and physical foundations and to testing psychological, social, and biological foundations of behavior.

The Human Biology emphasis parallels the Biology emphasis with the following differences:

Biology emphasis requirements NOT in the Human Biology emphasis:

- Field course requirement

Curriculum features NEW to the Human Biology emphasis:

- Required courses in Biology (not required for the Biology emphasis)
  - Freshman seminar course of either Pre-Health Professions or Biology Professions
- Required courses in Social Sciences and Humanities
  - General Psychology, Introductory Sociology, or Introduction to Social Problems
- Changes in elective choices
  - Allowance of human biology-related courses outside of Biology such as nutrition and osteology

Section III: Institutional Impact

Our department currently teaches many of the courses taken by pre-health students. The Human Biology emphasis will help us retain pre-health students as majors in the department while providing them with what we believe is the most appropriate background for success in professional schools and careers in health. Additionally, the Department of Biology has an excellent working relationship with the pre-health advising staff whose feedback was solicited in the development of the Human Biology emphasis.

The proposed change is not anticipated to significantly affect enrollments in any other instructional programs of affiliated departments or programs, nor will the proposed change affect any existing administrative structures. No changes in faculty or staff will be required, nor will any new physical facilities or modification to existing facilities be required. No equipment will need to be committed to initiate this change.

Section IV: Finances

We do not anticipate any costs or savings from this change. No new funds are required. We do not anticipate any budgetary impact on other programs since we teach most of the courses taken by pre-health students anyway.

Section V: Program Curriculum

All Program Courses (with New Courses in Bold)

This table continues on the folowing page.

Course Prefix and Number	Title	Credit Hours
Required Courses	<u>Required Biology Courses (27-28 credits)</u>:	
	BIOL 1050- Biology Professions	
	OR	
	BIOL 1060- Pre-Health Professions	1
	BIOL 1610- Biology I	4
	BIOL 1620- Biology II (BLS)	4
	BIOL 2220- General Ecology	3
	BIOL 3060- Principles of Genetics (QI)	4
	BIOL 5250- Evolutionary Biology (CI)	3
	BIOL 4600- Advanced Human Physiology	
	-OR-	
	BIOL 5600- Comparative Animal Physiology AND	
	BIOL 5610- Animal Physiology Laboratory	5
	BIOL 3300- General Microbiology	4
	-OR-	OR
	BIOL 5210- Cell Biology	3
	<u>Required Supporting Courses (3 credits)</u>	
	PSY 1010- General Psychology (BSS)	
	-OR-	
	SOC 1010- Introductory Sociology (BSS)	
	-OR-	
	SOC 1020- Introduction to Social Problems (BSS)	3

Course Prefix and Number	Title	Credit Hours
Required Courses (continued)	Required Physical Science Courses (32-39 credits): CHEM 1210- Principles of Chemistry I CHEM 1215- Chemical Principles Laboratory I CHEM 1220- Principles of Chemistry II (BSP) CHEM 1225- Chemical Principles Laboratory II CHEM 2310- Organic Chemistry I CHEM 2315- Organic Chemistry Laboratory I CHEM 2320- Organic Chemistry II CHEM 2325- Organic Chemistry Laboratory II CHEM 3700- Introductory Biochemistry AND CHEM 3710- Introductory Biochemistry Laboratory -OR- CHEM 5700- General Biochemistry I AND CHEM 5710- General Biochemistry II AND CHEM 5720- General Biochemistry Laboratory PHYS 2110- General Physics- Life Sciences I AND PHYS 2120- General Physics- Life Sciences II -OR- PHYS 2210/2215 Gen. Physics- Sci & Eng I (QI) AND PHYS 2220/2225 Gen. Physics- Sci & Eng II (QI) MATH 1210 Calculus I (QL) STAT 3000 Statistics for Scientists (QI)	 4 1 4 1 4 1 4 1 4 OR 9 8 OR 10 4 3
	Sub-Total	69-77
Elective Courses	4000 level or above BIOL or PUBH courses BIOL 2320 Human Anatomy BIOL 3100 Bioethics Maximum 4 credits from among the following: BIOL 4250 Internship/Co-Op (1-2 credits) BIOL 4710 Teaching Internship (1 credit) BIOL 5800 Undergraduate Research (1-3 credits) Up to 2 credits of seminar courses Up to 3 credits from other departments with approval of Director of Undergraduate Studies: Must be appropriate to the Human Biology emphasis, and must be different from the courses used to fulfill University Studies Depth Education requirements.	 9
	Sub-Total	9
Track/Options (if applicable)	NA	
	Sub-Total	0
	Total Number of Credits	78-86

Program Schedule

FRESHMAN YEAR					
Fall Semester (16 credits)			Spring Semester (15 credits)		
BIOL 1610	Biology I	4	BIOL 1620	Biology II	4
CHEM 1210	Principles of Chemistry I	4	CHEM 1220	Principles of Chemistry II (BPS)	4
CHEM 1215	Chemical Principles Laboratory I	1	CHEM 1225	Chemical Principles Laboratory II	1
BIOL 1050 Or BIOL 1060	Biology Professions Or Pre-Health Professions	1	PSY 1010 Or SOC 1010 Or SOC 1020	General Psychology Or Introductory Sociology Or Introduction to Social Problems	3
	University Studies or Math prerequisite courses (if students need Math courses prerequisite to MATH 1210, credits in addition to those listed here may be required	6		University Studies or Math prerequisite courses (if students need Math courses prerequisite to MATH 1210, credits in addition to those listed here may be required	3
SOPHOMORE YEAR					
Fall Semester (15-18 credits)			Spring Semester (15-18 credits)		
BIOL 2220	General Ecology	3	BIOL 3060	Principles of Genetics (QI)	4
CHEM 2300	Principles of Organic Chemistry I	3	CHEM 3700	Introductory Biochemistry	3
CHEM 2315	Organic Chemistry Laboratory I	1	CHEM 3710	Introductory Biochemistry Laboratory	1
MATH 1210	Calculus I (QL)	4	STAT 3000	Statistics for Scientists (QI)	3
	University Studies or Elective courses	5-7		University Studies or Elective courses	5-7
JUNIOR YEAR					
Fall Semester (15-18 credits)			Spring Semester (15-18 credits)		
BIOL 3300 Or BIOL elective	General Microbiology Or Elective	4 Or 3-4	BIOL 3300 or BIOL elective	General Microbiology Or Elective	4 or 3-4
PHYS 2110 Or PHYS 2110 & PHYS 2115	General Physics- Life Sciences I Or Physics for Sci. & Engineers I (QI) Physics for Sci. & Engineers Lab I	4 Or 5	PHYS 2110 Or PHYS 2110 & PHYS 2115	General Physics- Life Sciences II Or Physics for Sci. & Engineers II (QI) Physics for Sci. & Engineers Lab II	4 or 5
	University Studies or Elective courses	6-9		University Studies or Elective courses	6-9
SENIOR YEAR					
Fall Semester (15-18 credits)			Spring Semester (15-18 credits)		
BIOL 5250 Or BIOL elective	Evolutionary Biology (CI) Or BIOL elective	3	BIOL 5250 Or BIOL elective	Evolutionary Biology (CI) Or BIOL elective	3
Upper level Physiology with Laboratory Or BIOL elective	BIOL 5600 Comparative Animal Physiology And BIOL 5610 Animal Physiology Laboratory Or BIOL elective	5	Upper level Physiology with Laboratory Or BIOL elective	BIOL 4600 Advanced Human Physiology Or BIOL elective	5
	University Studies or Elective courses	7-15		University Studies or Elective courses	7-15

Cover/Signature Page - Abbreviated Template/Abbreviated Template with Curriculum

Institution Submitting Request: Utah State University
Proposed Title: Minor in Real Estate
Currently Approved Title:
School or Division or Location: Huntsman College of Business, Logan UT
Department(s) or Area(s) Location: Department of Economics and Finance
Recommended Classification of Instructional Programs (CIP) Code[1] (for new programs): 52.15
Current Classification of Instructional Programs (CIP) Code (for existing programs):
Proposed Beginning Date (for new programs): 08/15/2015
Institutional Board of Trustees' Approval Date:

Proposal Type (check all that apply):

Regents' General Consent Calendar Items		
R401-5 OCHE Review and Recommendation; Approval on General Consent Calendar		
SECTION NO.		ITEM
5.1.1	☒	Minor*
5.1.2	☐	Emphasis*
5.2.1	☐	(CER P) Certificate of Proficiency*
5.2.3	☐	(GCR) Graduate Certificate*
5.4.1	☐	New Administrative Unit
	☐	Administrative Unit Transfer
	☐	Administrative Unit Restructure
	☐	Administrative Unit Consolidation
5.4.2	☐	Conditional Three-Year Approval for New Centers, Institutes, or Bureaus
5.4.3	☐	New Center
	☐	New Institute
	☐	New Bureau
5.5.1	☐	Out-of-Service Area Delivery of Programs
5.5.2	☐	Program Transfer
	☐	Program Restructure
	☐	Program Consolidation
5.5.3	☐	Name Change of Existing Programs
5.5.4	☐	Program Discontinuation
	☐	Program Suspension
5.5.5	☐	Reinstatement of Previously Suspended Program
	☐	Reinstatement of Previously Suspended Administrative Unit

**Requires "Section V: Program Curriculum" of Abbreviated Template*

Chief Academic Officer (or Designee) Signature:
I certify that all required institutional approvals have been obtained prior to submitting this request to the Office of the Commissioner.

_____ _____
Signature Date:

Printed Name: _____

[1] CIP codes must be recommended by the submitting institution. For CIP code classifications, please see http://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55.

Program Request - Abbreviated Template
Utah State University
Minor in Real Estate
10/01/2014

Section I: Request

This request is to create a minor in real estate in the Department of Economics and Finance in the Jon M. Huntsman School of Business. The primary impact of this new minor will be the creation of two new courses.

Section II: Need

The creation of the new courses and a minor in real estate will afford students more educational options in an area where many have shown great interest. Each semester students inquire about additional courses that involve the topic of real estate. Currently we only offer one course in real estate. In contrast, the University of Utah offers 10 courses at the undergraduate and graduate level in real estate.

Section III: Institutional Impact

The real estate courses will be additional electives that can be taken by business majors. Although there will be some students who choose a real estate course in lieu of some other elective within the Huntsman School, no adverse impact is anticipated on other departments or programs. Further, no additional administrative resources will be needed. Advisors will need to be informed of the range and scope of the real estate courses and minor. There will be no need for additional faculty or staff. The courses will be taught by the existing faculty and staff who have expertise in this area of study.

Section IV: Finances

Currently, due to limited course offerings relative to the number of majors, upper division finance courses often have over 50 students in a section. Therefore, the department needs to offer additional upper division finance courses. The two new real estate courses will meet this need. These courses will be taught by an adjunct for a total cost of $13,000 per year. Existing departmental resources will fund this additional cost.

Section V: Program Curriculum

All Program Courses (with New Courses in Bold)

Course Prefix and Number	Title	Credit Hours
Required Courses		
FIN 3200	Financial Management	2
FIN 3400	Corporate Finance	2
FIN 4430	Real Estate Finance	3
FIN 4540 (new course)	Real Estate Valuation	3
FIN 4550 (new course)	Real Estate Development	3
	Sub-Total	13

Course Prefix and Number	Title	Credit Hours
	Total Number of Credits	13

Program Schedule

Fall Semester

FIN 3200 Financial Management – 2 hours
FIN 3400 Corporate Finance – 2 hours
FIN 4540 Real Estate Valuation – 3 hours

Spring Semester

FIN 4430 Real Estate Finance – 3 hours
FIN 4550 Real Estate Development – 3 hours

Appendix G: Abbreviated Template

Instructions:

- The Abbreviated Template should be used for those items identified as needing the Abbreviated Template in R401-4 and R401-5 and listed as possible items to check on the Cover/Signature Page below.

- An Abbreviated Template consists of a Cover/Signature Page – Abbreviated Template and Program Request – Abbreviated Template.
    - Cover/Signature Page – Abbreviated Template: Complete the items requested at the top of the page, INCLUDING SELECTING A CIP CODE. Check which type(s) of item(s) apply.
    - Program Request – Abbreviated Template: Complete the sections requested, removing the descriptive italics and replacing them with the content of the proposal.

- Prepare the Abbreviated Template per R401-6 instructions as a Word document (no PDF formats). Begin each of the two sections (Cover/Signature Page and Program Request) at the top of a new page. When *descriptions of the content required for each section appear in this font color,* the descriptive italics are to be removed and replaced with the institutional content before the institution submits the proposal to the OCHE.

- The CAO or his/her designated representatives should e-mail the completed Abbreviated Template (including electronic signature) to academicaffairs@ushe.edu.

- The institution is responsible for maintaining a record of the submission as the OCHE Academic and Student Affairs office is not responsible for storing electronic copies of submitted proposals.

Cover/Signature Page - Abbreviated Template/Abbreviated Template with Curriculum

Institution Submitting Request: Utah State University
Proposed Title: NA
Currently Approved Title: School Health Emphasis of the BS Health Education and Promotion
School or Division or Location: NA
Department(s) or Area(s) Location: Health, Physical Education & Recreation
Recommended Classification of Instructional Programs (CIP) Code[1] (for new programs): *NA*
Current Classification of Instructional Programs (CIP) Code (for existing programs): *13.1307*
Proposed Beginning Date (for new programs): *NA*
Institutional Board of Trustees' Approval Date: / /

Proposal Type (check all that apply):

Regents' General Consent Calendar Items		
R401-5 OCHE Review and Recommendation; Approval on General Consent Calendar		
SECTION NO.		ITEM
5.1.1	☐	Minor*
5.1.2	☒	Emphasis*
5.2.1	☐	(CER P) Certificate of Proficiency*
5.2.3	☐	(GCR) Graduate Certificate*
5.4.1	☐	New Administrative Unit
	☐	Administrative Unit Transfer
	☐	Administrative Unit Restructure
	☐	Administrative Unit Consolidation
5.4.2	☐	Conditional Three-Year Approval for New Centers, Institutes, or Bureaus
5.4.3	☐	New Center
	☐	New Institute
	☐	New Bureau
5.5.1	☐	Out-of-Service Area Delivery of Programs
5.5.2	☐	Program Transfer
	☐	Program Restructure
	☐	Program Consolidation
5.5.3	☐	Name Change of Existing Programs
5.5.4	☐	Program Discontinuation
	☐	Program Suspension
5.5.5	☐	Reinstatement of Previously Suspended Program
	☐	Reinstatement of Previously Suspended Administrative Unit

**Requires "Section V: Program Curriculum" of Abbreviated Template*

Chief Academic Officer (or Designee) Signature:
I certify that all required institutional approvals have been obtained prior to submitting this request to the Office of the Commissioner.

_____
Signature Date: / /

Printed Name:

[1] CIP codes must be recommended by the submitting institution. For CIP code classifications, please see http://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55.

Program Request - Abbreviated Template
Utah State University
School Health Emphasis- BS Health Education and Promotion
09/23/2014

Section I: Request

Discontinuation of the School Health Emphasis within the BS Health Education and Promotion degree. This will result in Utah State University no longer offering teacher education preparation for the Health endorsement.

Section II: Need

In the past three years the School Health emphasis at USU has averaged three graduates and this trend has been declining for the past decade. With the growth of the Community Health and Health Sciences emphases (approximate doubling from 70 to 145 students) within the BS Health Education and Promotion degree present resources make it extremely difficult to serve all three emphases. At present Weber State University offers the School Health Teaching Major while BYU, the U of U, and SUU offers the School Health Teaching Minor. These programs have the capacity to provide sufficient graduates to meet future state demand for licensed School Health teachers.

Section III: Institutional Impact

This discontinuation will also impact the School Health Minor as the HPER faculty will remove school health curriculum from academic courses and will no longer be offering supervisory services for teacher education in School Health. The School Health Emphasis at present has 15 students enrolled in the program. It is unclear if any of these students would switch to another emphasis within Health Education and Promotion or to another teaching degree. All remaining students who desire to earn the School Health Emphasis will be alerted to a schedule where the required courses will be offered in order for them to complete the program. No request for new faculty, staff or physical facilities will be submitted. We do not anticipate any negative impact on other undergraduate programs.

Section IV: Finances

No new funds are requested and there are no new budgetary impacts on the department or college.

Section V: Program Curriculum

All Program Courses

The current courses for the School Health Emphasis program will continue to be offered as part of the Community Health and Health Sciences emphases within the BS Health Education and Promotion degree with the following exceptions:

HEP 3300	Clinical Experience I	1 cr
HEP 4300	Clinical Experience II	1 cr
HEP 4400	Creative Methods in Teaching Health Education	3 cr
HEP 5500	Student Teaching Seminar	1 cr

HEP 5630	Student Teaching	10 cr

In order to complete the presently declared majors the following course schedule is recommended:

Program Schedule

Fall 2014

HEP 3300	*Clinical Experience I*	*1 cr*
HEP 4300	*Clinical Experience II*	*1 cr*
HEP 4400	Creative Methods in Teaching Health Education	3 cr
HEP 5500	*Student Teaching Seminar*	*1 cr*
HEP 5630	*Student Teaching*	*10 cr*

Spring 2015

HEP 3300	*Clinical Experience I*	*1 cr*
HEP 4300	*Clinical Experience II*	*1 cr*
HEP 4400	Creative Methods in Teaching Health Education	3 cr
HEP 4500	*Sexual Education within the Schools*	*3 cr*
HEP 5500	*Student Teaching Seminar*	*1 cr*
HEP 5630	*Student Teaching*	*10 cr*

Fall 2015

HEP 3300	*Clinical Experience I*	*1 cr*
HEP 4300	*Clinical Experience II*	*1 cr*
HEP 4400	Creative Methods in Teaching Health Education	3 cr
HEP 5500	*Student Teaching Seminar*	*1 cr*
HEP 5630	*Student Teaching*	*10 cr*

Spring 2016

HEP 3300	*Clinical Experience I*	*1 cr*
HEP 4300	*Clinical Experience II*	*1 cr*
HEP 4400	Creative Methods in Teaching Health Education	3 cr
HEP 4500	*Sexual Education within the Schools*	*3 cr*
HEP 5500	*Student Teaching Seminar*	*1 cr*
HEP 5630	*Student Teaching*	*10 cr*

Fall 2016

HEP 3300	*Clinical Experience I*	*1 cr*
HEP 4300	*Clinical Experience II*	*1 cr*
HEP 4400	Creative Methods in Teaching Health Education	3 cr
HEP 5500	*Student Teaching Seminar*	*1 cr*
HEP 5630	*Student Teaching*	*10 cr*

Spring 2017

HEP 3300	*Clinical Experience I*	*1 cr*
HEP 4300	*Clinical Experience II*	*1 cr*
HEP 4400	Creative Methods in Teaching Health Education	3 cr

HEP 4500	*Sexual Education within the Schools*	*3 cr*
HEP 5500	*Student Teaching Seminar*	*1 cr*
HEP 5630	*Student Teaching*	*10 cr*

If all declared students complete their student teaching prior to Spring 2017 course offerings may end sooner.

Appendix G: Abbreviated Template

Instructions:

- The Abbreviated Template should be used for those items identified as needing the Abbreviated Template in R401-4 and R401-5 and listed as possible items to check on the Cover/Signature Page below.

- An Abbreviated Template consists of a Cover/Signature Page – Abbreviated Template and Program Request – Abbreviated Template.
    - Cover/Signature Page – Abbreviated Template: Complete the items requested at the top of the page, INCLUDING SELECTING A CIP CODE. Check which type(s) of item(s) apply.
    - Program Request – Abbreviated Template: Complete the sections requested, removing the descriptive italics and replacing them with the content of the proposal.

- Prepare the Abbreviated Template per R401-6 instructions as a Word document (no PDF formats). Begin each of the two sections (Cover/Signature Page and Program Request) at the top of a new page. When *descriptions of the content required for each section appear in this font color,* the descriptive italics are to be removed and replaced with the institutional content before the institution submits the proposal to the OCHE.

- The CAO or his/her designated representatives should e-mail the completed Abbreviated Template (including electronic signature) to academicaffairs@ushe.edu.

- The institution is responsible for maintaining a record of the submission as the OCHE Academic and Student Affairs office is not responsible for storing electronic copies of submitted proposals.

Cover/Signature Page - Abbreviated Template/Abbreviated Template with Curriculum

Institution Submitting Request: Utah State University
Proposed Title: NA
Currently Approved Title: School Health Minor
School or Division or Location: NA
Department(s) or Area(s) Location: Health, Physical Education & Recreation
Recommended Classification of Instructional Programs (CIP) Code[1] (for new programs): *NA*
Current Classification of Instructional Programs (CIP) Code (for existing programs): *13.1307*
Proposed Beginning Date (for new programs): *NA*
Institutional Board of Trustees' Approval Date: / /

Proposal Type (check all that apply):

Regents' General Consent Calendar Items		
R401-5 OCHE Review and Recommendation; Approval on General Consent Calendar		
SECTION NO.		ITEM
5.1.1	☒	Minor*
5.1.2	☐	Emphasis*
5.2.1	☐	(CER P) Certificate of Proficiency*
5.2.3	☐	(GCR) Graduate Certificate*
5.4.1	☐	New Administrative Unit
	☐	Administrative Unit Transfer
	☐	Administrative Unit Restructure
	☐	Administrative Unit Consolidation
5.4.2	☐	Conditional Three-Year Approval for New Centers, Institutes, or Bureaus
5.4.3	☐	New Center
	☐	New Institute
	☐	New Bureau
5.5.1	☐	Out-of-Service Area Delivery of Programs
5.5.2	☐	Program Transfer
	☐	Program Restructure
	☐	Program Consolidation
5.5.3	☐	Name Change of Existing Programs
5.5.4	☐	Program Discontinuation
	☐	Program Suspension
5.5.5	☐	Reinstatement of Previously Suspended Program
	☐	Reinstatement of Previously Suspended Administrative Unit

**Requires "Section V: Program Curriculum" of Abbreviated Template*

Chief Academic Officer (or Designee) Signature:
I certify that all required institutional approvals have been obtained prior to submitting this request to the Office of the Commissioner.

_____
Signature Date: / /

Printed Name:

[1] CIP codes must be recommended by the submitting institution. For CIP code classifications, please see http://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55.

Program Request - Abbreviated Template
Utah State University
School Health Minor
09/23/2014

Section I: Request

Discontinuation of the School Health Teaching Minor. This will result in Utah State University no longer offering teacher education preparation for the Health endorsement.

Section II: Need

In the past three years the School Health Teaching Minor at USU has suspended acceptance due to inadequate clinical placement opportunities within Cache Valley and northern Utah. With the growth of the Community Health and Health Sciences emphases (approximate doubling from 70 to 145 students) within the BS Health Education and Promotion degree present resources make it extremely difficult to serve all emphases plus the Teaching Minor. At present Weber State University offers the School Health Teaching Major while BYU, the U of U, and SUU offers the School Health Teaching Minor. These programs have the capacity to provide sufficient graduates to meet future state demand for licensed School Health teachers.

Section III: Institutional Impact

The School Health Minor at present has no students enrolled in the program.

Section IV: Finances

No new funds are requested and there are no new budgetary impacts on the department or college.

Section V: Program Curriculum

All Program Courses

The School Health Minor at present has no students enrolled in the program. Therefore, a discontinuation schedule is not presented.

Cover/Signature Page - Abbreviated Template

Institution Submitting Request: *Utah State University*
Proposed Title: *PhD in Instructional Technology & Learning Sciences*
Currently Approved Title: *PhD in Instructional Technology & Learning Sciences*
School or Division or Location: *College of Education*
Department(s) or Area(s) Location: *Instructional Technology & Learning Sciences*
Recommended Classification of Instructional Programs (CIP) Code[1] (for new programs):
Current Classification of Instructional Programs (CIP) Code (for existing programs): 13.0501
Proposed Beginning Date (for new programs): Fall 2015
Institutional Board of Trustees' Approval Date:

Proposal Type (check all that apply):

R401-5 *Items submitted will be reviewed by OCHE. If there are any issues, the proposal will be returned for clarification/correction. If no issues, the proposal will be returned with a note of approval and the request will be placed on the General Consent Calendar of the next Regents' agenda.*			R401-6 *Items submitted will be reviewed by OCHE. If there are any issues, the proposal will be returned for clarification/correction. If no issues, the proposal will be returned with a note of approval and the request will be placed on the General Consent Calendar of the next Regents' agenda.*		
Section #		Item	Section #		Item
4.1.5.2	☐	Minor*	6.1.1	☐	Reinstatement of Previously Suspended Program
5.1.1.1	☐	New Emphasis on an Existing Degree*	6.1.5	☐	Reinstatement of Previously Suspended Unit
5.1.2	☐	Certificate of Proficiency Not Eligible for Financial Aid			
5.1.3	☐	Out-of-Service Area Delivery of Programs			
5.1.4	☐	Name Change of Existing Programs			
5.1.5	☐	Program Transfer			
	X	Program Restructure			
	☐	Program Consolidation			
5.1.6	☐	Program Discontinuation			
	☐	Program Suspension			
5.1.7	☐	Administrative Unit Creation			
	☐	Administrative Unit Transfer			
	☐	Administrative Unit Consolidation			
5.1.8	☐	New Center			
	☐	New Institute			
	☐	New Bureau			
5.1.9	☐	Graduate Certificate			

*Requires "Section VI: Program Curriculum" of Abbreviated Template

Chief Academic Officer (or Designee) Signature:
I certify that all required institutional approvals have been obtained prior to submitting this request to the Office of the Commissioner.

_____
Signature Date:

Printed Name:

[1] CIP codes must be recommended by the submitting institution. For CIP code classifications, please see http://nces.ed.gov/ipeds/cipcode/Default.aspx?y=55.

R401-5.5

Program Request - Abbreviated Template

Utah State University

PhD In Instructional Technology & Learning Sciences

8/20/2014

Section I: Request

The Department of Instructional Technology & Learning Sciences requests to restructure its PhD program. For this degree program the current credit hour requirements are 90 for BS to PhD and 60 for MS to PhD for incoming students. ITLS proposes that the minimum credit hours be reduced to 70 credit hours for the BS to PhD and to 43 for MS to PhD. This is a reduction of 20 credit hours from the BS to PhD and 17 credit hours from the MS to PhD.

Section II: Need

The awarding of a PhD is not based solely on the number of credits a student has taken; rather it is the mastery of knowledge and skills determined by written and oral comprehensive examinations and the completion of a body of original research (dissertation). Decreasing the number of credits will not affect the quality or rigor of the program but will allow students to complete in a more timely manner. The reduced credit requirements will also necessitate a closer connection between the student and his/her committee in order to establish a viable research plan from the beginning of the program.

Analysis of our peer institutions that offer a PhD in Instructional Technology, Table 1, indicates that all of the institutions require between 60 to 90 credits for a PhD, with the exception on the University of Memphis that requires 54 credits. With this proposed reduction we will become more competitive and will be able to recruit higher qualified applicants.

Table 1. Credits Required by peer Universities for a PhD in Instructional Technology or Learning Sciences, MS to PhD

Institution	Degree	Credits Required
Brigham Young University	PhD in Instructional Psychology & Technology	87
University of Washington	PhD in Learning Sciences	60
Indiana University	PhD in Instructional Systems Technology	60
University of Georgia	PhD in Learning, Design, & Technology	64
Florida State University	PhD in Instructional Systems	90
University of Memphis	PhD in Instructional Design & Technology	54

Section III: Institutional Impact

ITLS anticipates the reduction of required credit hours to obtain a PhD in Instructional Technology & Learning Sciences will increase our ability to recruit and retain the best students from around the country. This change will also help ITLS meet the goals of the recently submitted 5-year Graduate Program Plan. The change will not affect existing administrative structure. ITLS does not expect any changes in faculty or staff to implement the proposed changes.

Section IV: Finances

No additional costs are anticipated as a result of the proposed change. ITLS receives more qualified applications for the PhD than can be accepted in any given time frame. By reducing the credits from 90 to 70 for the BS to PhD program and from 60 to 43 for the MS to PhD program, ITLS may be able to increase the number of funded graduate students as students should be able to finish their degree quicker and require a reduced amount of tuition award dollars.

Institution Submitting Proposal*: Utah State University*

College, School or Division in Which Program/Administrative Unit Will Be Located*: Education*

Department(s) or Area(s) in Which Program/Administrative Unit Will Be Located*: Instructional Technology & Learning Sciences*

Program/Administrative Unit Title*: Instructional Technology & Learning Sciences (ITLS)*

Recommended Classification of Instructional Programs (CIP) Code*:* 13.0501

Certificate, and/or Degree(s) to Be Awarded*: PhD in Instructional Technology & Learning Sciences*

Proposed Beginning Date*: August 1, 2015*

Institutional Signatures (*as appropriate*)*:*

_____
Mimi Recker, Department Head
Instructional Technology & Learning Sciences

_____
Beth Foley, Dean
College of Agriculture

_____
Mark R. McLellan, V.P. of Research
Graduate School Dean

Date*:*

Institution Submitting Request: Utah State University
Proposed Title: Land-Plant-Climate Systems
Currently Approved Title: Environmental Soil / Water Sciences
School or Division or Location: College of Agriculture and Applied Sciences
Department(s) or Area(s) Location: Department of Plants, Soils and Climate
Recommended Classification of Instructional Programs (CIP) Code[5] (for new programs):
Current Classification of Instructional Programs (CIP) Code (for existing programs): 01.1299
Proposed Beginning Date (for new programs): 08/31/2015
Institutional Board of Trustees' Approval Date: MM/DD/YEAR

Proposal Type (check all that apply):

Regents' General Consent Calendar Items		
R401-5 OCHE Review and Recommendation; Approval on General Consent		
SECTION NO.		ITEM
5.1.1	☐	Minor*
5.1.2	☐	Emphasis*
5.2.1	☐	Certificate of Proficiency*
5.2.3	☐	Graduate Certificate*
5.4.1	☐	New Administrative Unit
	☐	Administrative Unit Transfer
	☐	Administrative Unit Restructure
	☐	Administrative Unit Consolidation
5.4.2	☐	New Center
	☐	New Institute
	☐	New Bureau
5.5.1	☐	Out-of-Service Area Delivery of Programs
5.5.2	☐	Program Transfer
	☒	Program Restructure
	☐	Program Consolidation
5.5.3	☒	Name Change of Existing Programs
5.5.4	☐	Program Discontinuation
	☐	Program Suspension
5.5.5	☐	Reinstatement of Previously Suspended Program
	☐	Reinstatement of Previously Suspended Administrative Unit

*Requires "Section V: Program Curriculum" of Abbreviated Template

Chief Academic Officer (or Designee) Signature:
I certify that all required institutional approvals have been obtained prior to submitting this request to the Office of the
Commissioner.

Signature Date: *MM/DD/YEAR*

Printed Name: *Name of CAO or Designee*

Proposal for a Restructuring and Name Change of Environmental Soil / Water Sciences to the Land-Plant-Climate Systems Major

SECTION I: Request

This proposal seeks approval for a restructuring and a name change of the major in Environmental Soil / Water Science (ESWS) to Land-Plant-Climate Systems in the Department of Plants, Soils and Climate (PSC). This is a renaming and realignment of curriculum from the current major. The proposed restructured program description and required courses are fully described in Appendix 1.

SECTION II: Need

The world is confronted by complex and connected problems including food insecurity and hunger, accelerating climate change, degradation of arable lands and challenges to the sustainability of ecosystem services. Climate change is projected to have profound effects on ecosystems and human activities including agriculture. The availability of water for communities and agriculture is threatened by water source degradation and over-exploitation. These problems are very complex, but do share the theme of interactions between the physical environment and the biosphere. We have a responsibility to provide objective knowledge to our students about agricultural sustainability, climate change, and the interactions in the earth's critical zone. The emerging issues of food security, climate and environmental change require that we harness our academic programs to ensure that PSC students become familiar with the science and objective knowledge underlying these issues. While many elements of the above problems are addressed in the present ESWS curriculum, the current academic structure does not provide readily for the integration of knowledge needed to address these issues for the 21st Century. Furthermore the name of the major does not emphasize the link to climate science and land systems studies that are true advantages of the Plants, Soils and Climate Department. The proposed major of Land-Plant-Climate Systems (LPCS) will explore the interactions between physical and biological sciences in the framework of promoting sustainable systems. There are currently no similar majors offered in the Utah Higher Education System (UHES). In the US Land Grant University system there are several examples that have similarities. The University of California at Davis in the Department of Land Air and Water Resources has a focus on the integrating themes of climate change, environmental quality, agricultural sustainability, and landscape interfaces and processes (http://lawr.ucdavis.edu/strategic_planning.htm). The University of Minnesota, Department of Soil, Water and Climate offers an undergraduate degree in Environmental Sciences, Policy and Management (http://www.swac.umn.edu/Education/ Undergrad/index.htm). The proposed integrated LPCS major in PSC would be a unique offering while maintaining the specialized disciplinary knowledge offerings of the previous ESWS major through emphases and minors.

A Major for Undergraduates Integrating Climate, Soils and Plants

The Plants, Soils and Climate Department currently offers undergraduate majors in Environmental Soil / Water Sciences, Plant Science and Residential Landscape Design and Construction. No formal major integrates Plants, Soils and Climate and no undergraduate major is available for students with a focus in climate or biometeorology. We currently offer six minors including: Climate Change and Energy, Crop Biotechnology, Agronomy, Soil Science, Ornamental Horticulture and Horticulture. However, there are several faculty members who are climate scientists with active research and teaching programs and there are students in PSC majors with interest in the area of applied climatology and environmental biophysics. The proposed major would add an emphasis for PSC undergraduate students to receive training in these

areas of science. Students interested in Sustainable Food Production will find an emphasis that considers both plant and animal aspects of agriculture. The number of students advised into a College of Agriculture and Applied Sciences (CAAS) Interdisciplinary Studies major has grown steadily from fewer than five to 24 in the past six years. The CAAS academic advisor who mentors these students estimates that about half are primarily interested in Sustainable Food Production. In addition, the current PSC majors do not adequately address the integration of land, plants and climate nor is there a program that promotes a systems approach to agricultural or environmental sciences. We will promote a problem solving approach in our teaching through new interdisciplinary courses and training students to become adaptive and flexible in their expertise.

Connections to General Student Population

Courses to be developed will include at least one breadth course in Physical Sciences and will support the current minor offerings. Required courses at the undergraduate level that serve students from natural resources and engineering will be improved through considerations to broaden the student experience.

SECTION III: Institutional Impact

The proposed major in Land-Plant-Climate Systems will not require additional faculty to initiate. Faculty to teach the courses have been identified and are generally already engaged in area of integrated scholarship. However, future full development of the program will require additional faculty in integrated environmental sciences with expertise in climate and water. Needs for interdisciplinary faculty are dependent upon student numbers. The PSC department already has professional advising for its undergraduates. The departmental faculty and department head have been consulted and are supportive of the restructuring of the major as indicated by the attached documentation.

SECTION IV: Finances

Teaching needs in the area of climate and water sciences will increase as student demand grows. University studies classes with large enrollments will request undergraduate teaching fellows as needed from Office of the Provost. Additional resources will be requested as justified based on enrollment and demand for new courses through the standard departmental, college and university channels.

References

American College & University Presidents Climate Commitment [ACUPCC]
from http://www.presidentsclimatecommitment.org/ Accessed 4/21/14

Institution Submitting Proposal: Utah State University

College, School or Division affected: College of Agriculture and Applied Sciences and Utah Climate Center

Department(s) or Areas(s) affected: Plants, Soils and Climate

Change Description: Rename and restructure the Environmental Soil and Water Science major to Land-Plant–Climate Systems major

Proposed Beginning Date: Fall 2015

Institutional Signatures (as appropriate):

_____, Department Chair

_____, Dean or Division Chair

_____, Chief Academic Officer

_____, President

_____, Date

Appendix 1. Program Description

(This is included as an appendix but can be formatted as Section V if necessary)

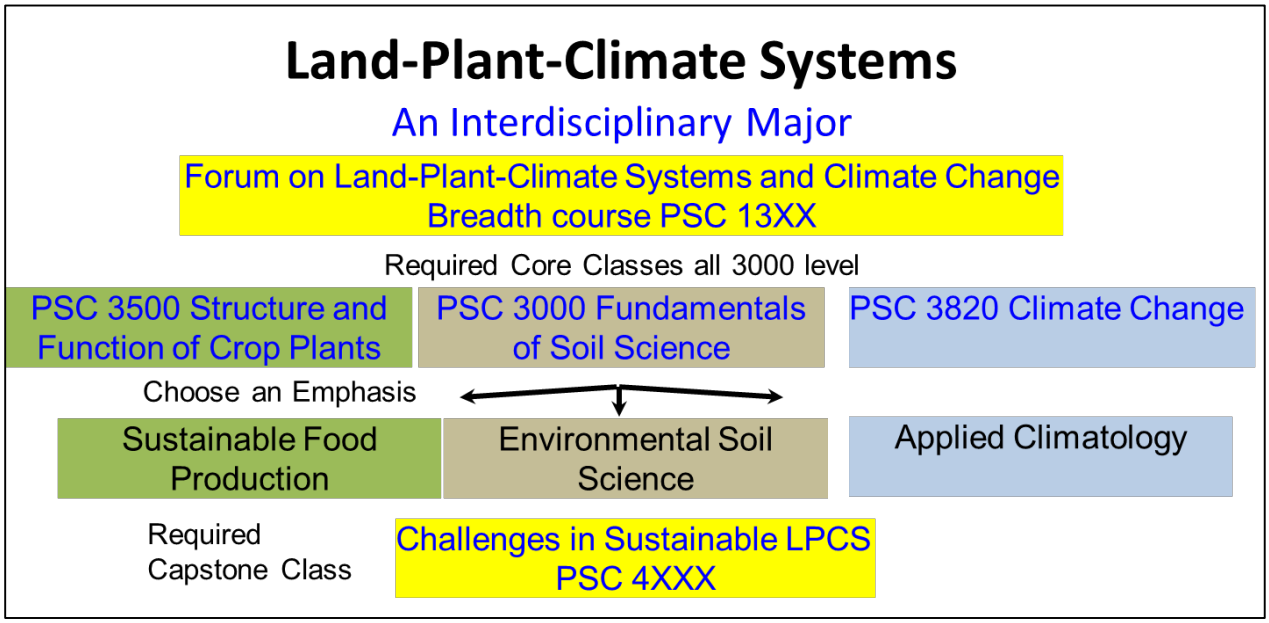

Fig. 1. Overview of LPCS Major

University General Education Requirements

Communications Literacy (6 credits) and Quantitative Literacy (3-4 credits), Math 1050 College algebra (QL) or a MATH course requiring MATH 1050 as a prerequisite is the minimum required for this major (most emphases require additional mathematics). Breadth Requirements include 18 credits at least one course from each of 6 categories. University Studies Depth Education Requirements (two CI, and one QI) and 2 credits in each: Depth Humanities and Creative Arts (DHA) and Depth Social Sciences (DSS).

Major Core Required Courses (15 credits)

The five 5 core classes required of all students to complete the major are described below. The PSC 13XX class will meet one breadth general education physical science requirement for students.

1. **PSC 13XX** Forum on Land-Plant-Climate Systems **BPS** (3)
2. **PSC 3500** Structure and Function of Crop Plants (3)
3. **PSC 3000** Fundamentals of Soil Science (4)
4. **PSC 3820** Climate Change **DSC/QI** (3)
5. **PSC 4XXX** Challenges in Sustainable Land-Plant-Climate Systems (Capstone) **CI** (2)

New Courses Proposed, Required for the Major

PSC 13XX Forum on the Land-Plant-Climate Systems *(BPS)*

Introductory breadth physical science class designed to explore global challenges facing the world and local communities in food security, water availability, land degradation, climate change and agricultural and environmental sustainability. Communication and quantitative skills for assessing these complex issues will be strengthened and form the basis for further work on interactions of water with plants in the terrestrial environment. Water, soils, plants and the atmosphere form a physically integrated, dynamic system in which the various flow processes of energy and matter occur. This is proposed as a new course but may eventually replace the current PSC 2010 Soils, Waters and the Environment (BPS).
3 credits PSC faculty

PSC 4XXX Challenges in Sustainable Land-Plant-Climate Systems (CI)

Capstone experience for students completing the major. Students integrate socio-economic and sustainability concepts in the analysis of agricultural and environmental problem(s) and present findings in oral and written reports. Students will engage in collaborative research using their knowledge of Land-Plant-Climate systems. This is proposed as a new course but will eventually replace both the current PSC 4820 Challenges in Climate Change and Energy (CI) and PSC 5740 Environmental Quality: Soil and Water.

Prerequisites: PSC 3820 Climate Change; PSC 3000 Fundamentals of Soil Science, PSC 3500 Structure and Function of Plants
2 credits, PSC faculty

Subtotal = 5 credit hours

Emphasis Required Courses

Select One Emphasis and complete emphasis requirements

Sustainable Food Production
Environmental Soil Science
Applied Climatology

Total = 120-124 credit hours

Courses and Requirements listed in each emphasis include the courses required for the LPCS major for completeness.

Sustainable Food Production

Addressing the challenges in the search for sustainable food production requires a diverse understanding of agriculture and the environment. The goal of sustainable agriculture is to support integrated systems of plant and animal production practices that will, over the long term: satisfy human food and fiber needs; enhance environmental quality and the natural resource base, make the most efficient use of nonrenewable resources and on-farm resources, sustain economic viability of agriculture; and enhance the quality of life for farmers, farm workers and society as a whole. The number of students advised into a College of Agriculture and Applied Sciences (CAAS) Interdisciplinary Studies major has grown steadily from fewer than five to 24 in the past six years. The CAAS academic advisor who mentors these students estimates that about half are primarily interested in Sustainable Food Production. Students in the Sustainable Food Production emphasis will gain a strong foundation in science and develop an individualized curriculum inclusive of animal and crop production as well as the economic and sociological implications of agricultural production. Specific courses will be selected across disciplines within CAAS and tailored to meet each student's interests and goals. The Sustainable Food Production emphasis will include a farm practicum as well as the Land-Plant-Climate Systems capstone course to provide both farming experience and real-world, interdependent problem-solving experience. This emphasis will provide students with an understanding of the interdisciplinary nature of farming systems by emphasizing the ecological theory underpinning the design of farming systems for maximal sustainability. Students will gain a firm foundation for a variety of career options such as owning their own farming enterprise or working as a farm manager for a larger conventional or organic operation. Students will have a sufficiently strong foundation in science to undertake graduate work in agroecology, and they will also be prepared for further study in agricultural business, outreach or policy.

Emphasis in Sustainable Food Production

General Education Requirements (37 credits)

ENGL 1010 (**CL**) Introduction to Writing (or test)	**3**
ENGL 2010 (**CL**) Intermediate Writing	**3**
ASTE 2900 (**BSS**) Humanity in the Food Web	**3**
WILD 2200 (**BLS**) Ecology of Our Changing World	**3**
APEC 3010 (**DSS**) Intro.to Agricultural Economics and Agribusiness	**3**
HIST 3950 (**DHA**; **CI**) Environmental History	**3**
MATH 1050 (**QL**) College Algebra	**4**
PHIL 1120 (**BHU**) Social Ethics	**3**
PSC 13XX (**BPS**) Forum on the Land-Plant-Climate Systems	**3**
USU 1300 (**BAI**) US Institutions	**3**
USU 1330 (**BCA**) Civilization: Creative Arts	**3**
ASTE 5260 (**CI**) Environ. Impacts of Agric. Systems	**3**
(**QI**) * see below	

Required Preparatory and Professional Core Courses (50-53 credits)

BIOL 1610 (**BLS**) Biology I	**4**

BIOL 1620 (**BLS**) Biology II	**4**
CHEM 1110 (**BPS**) General Chemistry I	**4**
CHEM 1115 (**BPS**) General Chemistry I Lab	**1**
GEO 3150 (**DSC/QI**) Energy in the 21st Century	**3**
PSC 2800 Fundamentals of Organic Agriculture	**3**
PSC 3000 Fundamentals of Soil Science	**4**
PSC 3500 Structure and Function of Plants	**3**
PSC 3600 Introduction to Plant Breeding and Heredity	**2**
PSC 3820 Climate Change (**DSC/QI**)	**3**
BIOL 4430 Introduction to Plant Pathology	**4**
BIOL 4500 Applied Entomology	**3**
PSC 5550 Weed Biology and Control	**3**
PSC 4900 Organic Farm Practicum **and/or**	
PSC 4250 Internship in Plants, Soils and/or Climate	**1-4**
PSC 5530 (**QI**) Soils and Plant Nutrient Bioavailability	**3**
PSC 5XXX Advanced Agroecology	**3**
PSC 4XXX (**CI**) Challenges in Sustainable LPCS	**2**

Agricultural Coursework
Select at least 18 credits from the following):

ADVS 1100 Small-Scale Animal Production	**3**
ADVS 5030 Sustainable Agricultural Production Systems w/ Animals	**3**
ASTE 1130 Planting and Tillage Equipment	**3**
ASTE 3080 Compact Power Units for Agric. and Turfgrass Apps.	**3**
PSC 3420 (**QI**) Landscape Irrigation Design	**2**
PSC 4000 Soil and Water Conservation	**4**
PSC 4050 Greenhouse Management and Crop Production	**4**
PSC 4280 Field Crops	**3**
PSC 4320 Forage Production and Pasture Ecology	**3**
PSC 4400 Modern Vegetable Production	**3**
PSC 4200 Temperate Zone Fruit Production	**3**
PSC 4700 Irrigated Soils	**3**
WILD 4000 Rangeland Management	**3**
WILD 4500 Conservation Biology	**3**

Human Systems Coursework
Select at least 12 credits from the following:

ENVS 2340 (**BSS**) Natural Resources and Society	**3**
ENVS 3330 Environment and Society	**3**
ENVS 4700 Communicating Sustainability	**3**
ENVS 5550 Sustainability: Concepts and Measurement	**3**
LAEP 2039 Foundations of Sustainability	**3**
MGT 2350 Small Business Management	**3**
MGT 3500 Fundmentals of Marketing	**3**
MIS 5700 (**DSS**) Internet Mngt. & Electronic Commerce	**3**
NDFS 1260 Food Literacy	**3**

PHIL 3510 Environmental Ethics	**3**
SOC 3610 (**DSS**) Rural Sociology	**3**
SOC 4620 (**DSS**) Sociology of the Environment and Natural Res.	**3**
SOC/ENVS 5640/6640(**CI**) Conflict Management in Natural Res.	**3**
WATS 1200 (**BLS**) Biodiversity and Sustainability	**3**

Total Required 117-120 (minimum 120 required for BS degree)

Environmental Soil Sciences

This emphasis prepares students for careers or advanced study in the environmental and soil sciences and the management of land and water resources. Students gain fundamental understanding of the basic sciences and mathematics, as well as a strong background in soil science. Courses emphasize the interactive soil/water processes in terrestrial ecosystems—from the microscopic to the landscape perspective. From this base, each student can design his or her own program of specialization. Graduates are prepared for a variety of career opportunities in the public and private sectors, or to advance their educations in competitive graduate programs.

Emphasis in Environmental Soil Science

General Education Requirements (**32 credits**)

(**CL1**) ENGL 1010 Introduction to Writing (or test)	**3**
(**CL2**) ENGL 2010 Intermediate Writing	**3**
(**QL**) (see Mathematics requirement)	
(**BAI**)	**3**
(**BCA**)	**3**
(**BHU**)	**3**
(**BLS**) WILD 2200 Ecology of Our Changing World*	**3**
(**BPS**) PSC 13XX Forum on the LPCS*	**3**
(BSS) suggest ASTE 2900 Humanity in the Food Web	**3**
(**DHA**) suggest HIST 3950 Environmental History (CI)	**3**
(**DSS**) suggest APEC 3010 Intro. to Ag Econ. or APEC 3012	**3**
(**QI**) see preparatory classes	
(CI) PSC 48XX Challenges in LPCS* and 1 other	**2**

***** These specific courses are required for the LPCS major or the ESS emphasis as well

Required Preparatory Courses (**46-50** credits)

BIOL 1610 Biology I	**4**
GEO 1110 Physical Geology (BPS)	**3**
GEO 1115 Physical Geology Lab	**1**
PSC 3000 Fundamentals of Soil	**4**
PSC 3500 Structure and Function of Plants	**3**
PSC 3820 Climate Change (**DSC/QI**)	**3**

Complete *one* of the two following blocks of Chemistry courses (9 or 10):

Block 1 (9 credits)

CHEM 1110 General Chemistry I (BPS)	**4**
CHEM 1120 General Chemistry II (BPS)	**4**
CHEM 1125 General Chemistry II Laboratory	**1**

or

Block 2 (10 credits)

CHEM 1210 Principles of Chemistry I	**4**
CHEM 1215 Chemical Principles Laboratory I	**1**
CHEM 1220 Principles of Chemistry II (BPS)	**4**
CHEM 1225 Chemical Principles Laboratory II	**1**

Complete *one* of the two following blocks of Mathematics courses and *one* Statistics Course, also covers Quantitative Literacy (QL) (11-14 credits):

Block 1 (10 credits)		
MATH 1050	College Algebra (QL)	**4**
MATH 1060	Trigonometry	**2**
MATH 1210	Calculus I (QL)	**4**
or		
Block 2 (8 credits)		
MATH 1210	Calculus I (QL)	**4**
MATH 1220	Calculus II (QL)	**4**
STAT 2000	Statistical Methods (QI)	**4**
or		
STAT 3000	Statistics for Scientists (QI)	**3**

Complete *one* of the two following blocks of Physics courses (8 credits):

Block 1 (8 credits)		
PHYS 2110	General Physics - Life Sciences I	**4**
PHYS 2120	General Physics - Life Sciences II (BPS)	**4**
or		
Block 2 (8 credits)		
PHYS 2210	Physics for Scientists and Engineers I (QI)	**4**
PHYS 2220	Physics for Scientists and Engineers II (BPS/QI)	**4**

Required Professional Core (17 credits)

PSC 5050	Principles of Environmental Soil Chemistry	**3**
PSC 5130	Soil Genesis, Morphology, and Classification	**4**
PSC 5670	Environmental Soil Physics	**4**
PSC 5560	Analytical Techniques for the Soil Environment	**3**
PSC 5310	Soil Microbiology	**3**
or		
PSC 5530	Soils and Plant Nutrient Bioavailability (QI)	**3**

Further Discipline Related Courses (15 credits)

Select 15 credits from this list of PSC, ASTE, GEO, WATS, WILD courses with advisor

PSC 2800	Fundamentals of Organic Agriculture	**3**
PSC 3400	Arboriculture	**3**
PSC 3600	Introduction to Plant Breeding and Heredity	**2**
PSC 3810	Turfgrass Management	**3**
PSC 4000	Soil and Water Conservation	**4**

PSC 4200 Temperate Zone Fruit Production	**3**
PSC 4280 Field Crops	**3**
PSC 4320 Forage Production and Pasture Ecology	**3**
PSC 4400 Modern Vegetable Production	**3**
PSC 4500 Soil Reclamation	**3**
PSC 4700 Irrigated Soils	**3**
PSC 5100 Prof. Turf and Urban Landscape Water Management	**3**
PSC 5200 Site Specific Agric. and Landscape/Hort. Management	**3**
PSC 5270 Environmental Plant Physiology	**2**
PSC/BIOL 5310 Soil Microbiology	**3**
PSC/WILD 5350 Wildland Soils	**3**
PSC 5400 General Meteorology	**3**
PSC 5430 Plant Nutrition	**2**
PSC 5500 Environmental Physics of Land Ecosystems and Climate	**3**
PSC 5530 Soils and Plant Nutrient Bioavailability (QI)	**3**
PSC 5550 Weed Biology and Control	**4**
PSC/CEE/WATS 5003 Remote Sensing of Land Surfaces	**3**
ASTE 5260 Environmental Impacts of Agricultural Systems (CI)	**3**
BIOL 4430 Introduction to Plant Pathology	**4**
BIOL 4500 Applied Entomology	**3**
CEE 3430 Engineering Hydrology	**3**
CEE 5000 Irrigation and Drainage of Agricultural Lands	**3**
CEE 5190 Geographic Information Systems for Civil Engineers	**3**
CHEM 3000 Quantitative Analysis (QI)	**3**
GEO 3500 Minerals and Rocks	**4**
GEO 3150 Energy in the 21st Century (DSC/QI)	**3**
GEO 3550 Sedimentation and Stratigraphy (CI)	**4**
GEO/WATS 3600 Geomorphology	**4**
GEO 5510 Groundwater Geology (QI)	**3**
GEO 5520 Techniques of Groundwater Investigations (CI)	**3**
GEO 5600 Geochemistry	**3**
GEO 5630 Geologic Image Analysis	**3**
GEO/WATS 5150 Fluvial Geomorphology	**3 or 4**
GEO 5680 Paleoclimatology	**3**
WATS 3700 Fundamentals of Watershed Science (CI)	**3**
WATS 4500 Limnology: Ecology of Inland Waters	**3**
WATS 4530 Water Quality and Pollution	**3**
WATS 4930 Advanced GIS and Spatial Analysis	**3**
WATS 5640 Riparian Ecology and Management	**3**
WILD 3600 Wildland Plant Ecology and Identification	**4**
WILD 4750 Monitoring and Assessment in Natural Resource and Environmental Management	**3**
WILD 4910 Assessment and Synthesis in Natural Resource Science	**3**
WILD 5750 Applied Remote Sensing	**3**

Total required 110-114 (minimum 120 required for BS degree)

Applied Climatology

The program integrates basic and applied principles of meteorology, climatology and environmental physics with land surface processes, especially water. A sound background in math, physics and the basis of physical science is utilized to examine the biophysical interactions between land ecosystems and climate at various scales. This includes learning about instrumentation and measurements of the atmosphere, soil, water and plants in the field, and how the data are used to address practical issues related to climate, water and energy. The graduates would be well prepared to pursue graduate education in atmospheric science, climatology, hydrology and most other physical sciences, but especially suited for interdisciplinary science programs. They would also be suited to work with private consulting firms to address practical problems related to issues such as climate, weather, energy and water use. Finally, they will immediately be well prepared for positions as research technicians in federal, state and university laboratories.

Emphasis in Applied Climatology

General Education Requirements (32 credits)

(**CL1**) ENGL 1010 Introduction to Writing (or test)	**3**
(**CL2**) ENGL 2010 Intermediate Writing	**3**
(**QL**) see preparatory courses	
(**BAI**)	**3**
(**BCA**)	**3**
(**BHU**)	**3**
(**BLS**) WILD 2200 Ecology of Our Changing World*	**3**
(**BPS**) PSC 13XX Forum on the LPCS*	**3**
(BSS) suggest ASTE 2900 Humanity in the Food Web	**3**
(**DHA**) suggest HIST 3950 Environmental History(CI)	**3**
(**DSS**)	**3**
(**QI**) see preparatory courses	
(CI) PSC 48XX Challenges in LPCS* and 1 other	**2**

***** These specific courses are required for the LPCS major or the AC emphasis as well

Required Preparatory Courses (48 credits)

BIOL 1610 Biology I	**4**
MATH 1210 Calculus I	**4**
MATH 1220 Calculus II	**4**
MATH 2250 Linear Algebra and Differential Equations	**4**
STAT 3000 Statistics for Scientists	**3**
PHYS 2210 Physics for Scientists & Engineers I	**4**
PHYS 2220 Physics for Scientists & Engineers II	**4**
CHEM 1210 Principles of Chemistry	**4**
GEO 1110 Physical Geology	**3**
GEO 1115 Physical Geology Lab	**1**
PSC 2000 Atmosphere and Weather	**3**
PSC 3000 Fundamentals of Soil Science	**4**
PSC 3820 Climate Change	**3**
PSC 3500 Structure and Function of Plants	**3**

Required Professional Core (26 credits)

GEO 3150 Energy in the 21st Century	**3**
PSC 5000 Environmental Instrumentation	**2**
PSC 5270 Environmental Plant Physiology	**2**
PSC 5670 Environmental Soil Physics	**4**
PSC 5500 Land-Atmosphere Interactions	**2**
PSC 5300 Remote Sensing of Land Surfaces	**4**
PSC 5400 General Meteorology	**3**
GEO 5680 Paleoclimatology	**3**
PSC 6900 Special Problems Climate Data Analysis	**3**

Further Discipline Courses (choose 12 credits)

Select 15 credits from this list of supporting courses

CEE 3430 Engineering Hydrology	**3**
GEO 1110 Physical Geology and Geo 1115 Laboratory	**4**
GEO 3200 Earth Through Time (QI/DSC)	**3**
GEO 5440 Paleoecology (CI)	**2**
GEO 3100 Natural Disasters (DSC)	**3**
GEO 3600 Geomorphology	**4**
JCOM 1130 Beginning Newswriting for the Mass Media	**3**
ENVS 5750 Sustainable Living	**3**
ECON 5560 Natural resources and environmental economics	**3**
PSC 4200* Global and Regional Climatology	**2**
WILD/BIOL/SOIL 6200 Biogeochem of Terrestrial Ecosys	**3**

*Possible New Classes to Be Created

Total required 118 (minimum 120 required for BS degree)

Considerations for General Education Requirements (30-34 credits)

Competency Requirements (9-10 credits)
CL 6 credits, QL 3-4 credits,
Breadth Requirements (18-20 credits)
BAI, BCA, BHU, BLS, BPS and BSS
Exploration Requirement (3-4 credits)
Depth Education Requirements
CI 2 courses, QI 1 course, 1 DHA + 1 DSS (4 cr. min.)
Upper Division Credits Requirement
40 credits numbered 3000 or above

Some suggested courses to fulfill General Studies Requirements

ASTE 5260 (CI) Environ. Impacts of Agric. Systems	3
ASTE 2900 (BSS) Humanity in the Food Web	3
ENGL 1010 (CL) Introduction to Writing	3
ENGL 2010 (CL) Intermediate Writing	3
HIST 3950 (DHA; CI) Environmental History	3
JCOM 1510 (BSS) Introduction to Mass Communication	3
PHIL 4310 (DHA) Philosophy of Science	3
PHIL 3510 (DHA) - Environmental Ethics	3
POLS 3810 (DSS) Introduction to Public Policy	3
USU 1300 (BAI) US Institutions	3
USU 1330 (BCA) Civilization: Creative Arts	3
WILD 2200 (BLS) Ecology of Our Changing World	3